Aquatic Invertebrate Species of Concern: Updated Distributions, Vital Watersheds and Predicted Sites within USFS Northern Region Lands

Prepared for:

USDA Forest Service, Northern Region

By:

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Executive Summary

An additional 70 stream sites on U.S. Forest Service Northern Region lands in Montana were surveyed for the presence of 20 aquatic macroinvertebrate species meeting USFS Species of Conservation Concern (SOC) criteria. No new sites were sampled in Idaho in 2007, but 48 sites were sampled in 2008. Sampling was focused within or adjacent to the Northern Rocky Mountain Refugium (NRMR) area, but also included areas outside of this range, including sites on the Custer National Forest (Pryor Mountains and Ashland District). For 2007, nine of the 26 sites sampled (35%) had at least one Species of Concern. These were located in the Beaverhead-Deerlodge (2), Flathead (1) and Lolo (6) National Forests. In 2008, 36 of the 92 sites sampled (39%) had at least one Species of Concern. These were located in the Clearwater (24), Flathead (1) and Lolo (11) National Forests. The majority of sites with Species of Concern were characteristic of headwater forested, high-gradient, fishless streams, with the exception of Vermillion River and Beaver Creek, which were lower gradient, salmonid bearing streams. These surveys, as well as compilation of other records, resulted in 22 new stream locations harboring USFS aquatic macroinvertebrate SOC across three sub-watersheds within the Lolo National Forest.

Detections from the 2006-2008 surveys and other compiled records were used to create models of species' predicted distributions in order to assist with future sampling efforts and management decisions. Predicted species' distribution models were developed at 90m pixel resolution, using point location data for 10 SOC species and 11 environmental data layers. The predictive models demonstrated that the majority of USFS SOC species occur in moderate to higher elevation (>1700m), small tributary streams with wetter precipitation regimes. Surveys and predictive models support the conclusion that the number of USFS aquatic SOC increases near the Montana / Idaho border, especially within the Clearwater and Lolo National Forest Refugium area. We recommend protecting these critical watershed habitats (e.g. headwater NRMR areas) for these macroinvertebrate SOC from future road development and habitat degradation by following RCA management practices for protecting riparian areas, as well as designating the upper St. Regis basin of the Lolo National Forest, in particular the upper tributaries of Big Creek and Deer Creek downstream to, and including, Chromie Creek, a candidate on the Research Natural Area list for Montana.

Additional aquatic macroinvertebrate inventory to validate the predictive distribution models and solidify species' habitat associations is worthwhile, especially as it pertains to developing a long-term monitoring scheme and a robust riparian management protection plan. Predictive model output for most species indicates that the greatest number of gaps in known SOC ranges may be filled with additional structured surveys in portions of northwestern Montana (particularly the Cabinet Mountains), the Bitterroot Mountains in Mineral and Ravalli Counties, Beaverhead, Madison, and Silver Bow Counties, and portions of the island mountain ranges in eastern Montana (particularly the Big Snowy Mountains).

Extensive surveys were performed on USFS lands for the western pearlshell mussel, *Margartifera falcata*, a USFS Species of Interest (SOI). MTNHP and USFS biologists surveyed 230 stream reaches on or within 1 km of the Beaverhead-Deerlodge, Bitterroot, Gallatin, Helena, Kootenai, Lewis and Clark and Lolo National Forests. Only 16 viable populations from 11 streams were documented (6 exceptional and 10 with good viability). Western pearlshell populations were present in an additional 80 stream reaches, but all appeared to have poor viability. This adds additional evidence of significant statewide population declines for this species.

Acknowledgements

I especially wish to thank Ann Carlson (USFS Northern Region) who recognized the need to address aquatic invertebrates in the forest planning process, appreciated the limited information available for management decision making, and promoted the project through an existing USFS agreement with the MTNHP and Idaho Conservation Data Center (IDCDC). Thanks need to go to present and previous Heritage Program zoologists who chose to address rare invertebrates when no one else would. Bill Bosworth (IDCDC) arranged a contractor to sample many of the ID sites within the Clearwater National Forest. I wish to thank all the field crews on the PIBO project and Montana and Idaho DEQ monitoring efforts who are out there every year collecting valuable data, and the taxonomists identifying thousands of invertebrates in an effort to characterize stream habitat or water quality, and in turn sometimes documenting these rare species. R. Wisseman and J. Sandberg reviewed some of the caddisfly and stonefly taxa, respectively, from our collections. For collecting additional mussel data, I thank D. Downing, S. Gerdes, P. Hutchinson, P. Hopper, R. Pierce, P. Price, M. Jakober, S. Spaulding and their crews. Scott Blum (MTNHP) entered and reviewed data in the state-wide Point Observation Database (POD) S. Lenard (MTNHP), J. Gustin (IDCDC), L.Wilson, and C. Currier (MTNHP) assisted in field work. Coburn Currier formatted, edited and printed this report. Meghan Burns (MTNHP) produced the maps in this report.

Table of Contents

Introduction 1
Methods 3
    Field Surveys and Laboratory Processing 3
    Predictive Modeling 4
Results and Discussion 5
    Overview 5
    Northern Region Species (SOC and SOI) Updates 9
Conclusions and Recommendations 25
Literature Cited 27

Appendix A. Global/State Rank Definitions
Appendix B. Aquatic Macroinvertebrate Survey Sites in 2008
Appendix C. Western Pearlshell Mussel Survey Sites 2006-2008

List of Figures

Figure 1. Map of Montana and Idaho USFS boundaries 1
Figure 2. Typical 2nd order steep forested stream supporting 3 aquatic SOC in the NRMR 1
Figure 3. Headwater 1st order forested stream supporting one aquatic SOC in the NRMR 2
Figure 4. Aquatic macroinvertebrate survey sites with detected SOC sampled in 2006 3
Figure 5. Aquatic macroinvertebrate survey sites with detected SOC sampled in 2007 5
Figure 6. Aquatic macroinvertebrate survey sites with detected SOC sampled in 2008 6
Figure 7. All aquatic macroinvertebrate survey sites compiled for this study in 2008 6
Figure 8. Map of western pearlshell, *Margaritifera falcata* survey sites and population viability on or within 1km of USFS owned lands with data current to 2007 8
Figure 9. Map of western pearlshell, *Margaritifera falcata* survey sites and population viability on or within 1km of USFS owned lands with data current to 2008 8
Figure 10. Diagram of new SOC caddisfly, *Philocasca banksi* or *P. antennata* 12
Figure 11. USFS Northern Region Distribution for the caddisfly, *Philocasca banksi* 12
Figure 12. USFS Northern Region Distribution for the mayfly, *Caudatella edmundsi* 15
Figure 13. Predictive Distribution Model Output Map for the mayfly, *Caudatella edmundsi* 15
Figure 14. Predictive Distribution Model Output Map for the caddisfly, *Sericostriata surdickae* 16
Figure 15. Predictive Distribution Model Output Map for the caddisfly, *Rhyacophila potteri* 17
Figure 16. Predictive Distribution Model Output Map for the caddisfly, *Goereilla baumanni* 18
Figure 17. Predictive Distribution Model Output Map for the stonefly, *Soyedina potteri* 19
Figure 18. Predictive Distribution Model Output Map for the caddisfly, *Rossiana montana* 20
Figure 19. Predictive Distribution Model Output Map for the caddisfly, *Agapetus montanus* 21

List of Figures (continued)

Figure 20. Predictive Distribution Model Output Map for the mayfly, *Caurinella idahoensis* 22
Figure 21. Predictive Distribution Model Output Map for the Clearwater Roachfly, *Soliperla salish* 23
Figure 22. USFS Northern Region Distribution for the stonefly, *Zapada cordillera* 24
Figure 23. Predictive Distribution Model Output Map for the stonefly, *Zapada cordillera* 24
Figure 24. Crucial watersheds of aquatic biodiversity in the upper Columbia Basin in MT 25

List of Tables

Table 1. MTNHP 2007 Survey sites where Species of Concern were detected 7
Table 2. MTNHP 2009 Northern Region Species of Concern (SOC) List 10
Table 3. MTNHP 2009 Northern Region Species of Interest (SOI) List 11
Table 4. Aquatic SOC observations used in Maxent modeling effort 9

Introduction

Headwater streams are important functional components of the larger watershed, providing water, sediment, and organic material retention and delivery to downstream reaches (Meyer and Wallace 2001). Typically these source streams are fishless due to natural (high gradient/waterfalls) or man-made (poorly designed culverts) downstream barriers, and thus have received less attention relative to their dominance on the landscape (Richardson 2000). This neglect is despite the fact that they typically support diverse and often unique assemblages of aquatic invertebrate and vertebrate fauna (Olson et al. 2007, Meyer et al. 2007). Only recently have biologists become increasingly concerned with aquatic species and habitats not directly related to native or non-native sport-fish (i.e. trout and salmon) (Richardson 2000). Recently surveyed forested headwater streams of western Montana watersheds have yielded significant discoveries of species of conservation concern (SOC), range extensions, endemic genera, disjunct populations and newly described species (Frest and Johannes 1995, Fend and Gustafson 2001, Leonard et al. 2003, Stark and Gustafson 2004, Hendricks 2003, Stagliano et al. 2007, Maxell 2009). This hot-spot of endemism straddling the Idaho border has been referred to as the Northern Rocky Mountain Refugium (NRMR) (Johnston and Steele 1978, Stark and Gustafson 2004, Stagliano et al. 2007). The NRMR area is bounded by Idaho's Clearwater National Forest and the western portion of the Lolo National Forest in Montana; a portion of the area in Idaho has been called the Clearwater Refugium (Daubenmire 1975, Brunsfeld et al. 2001) (Figure 1).

One of the most frequently described habitats harboring these aquatic invertebrate species of conservation concern is the high elevation, steep gradient, densely-forested headwater stream and adjacent riparian areas within USFS managed lands (Stark and Gustafson 2004, Stagliano et al. 2007) (Figure 2 and 3).

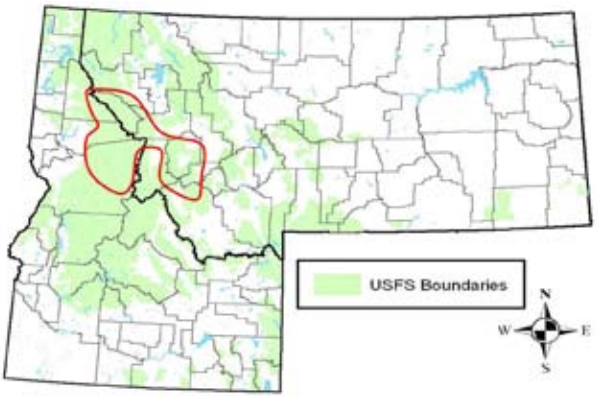

Figure 1. Map of Montana and Idaho USFS boundaries. Red line delineates the NRMR.

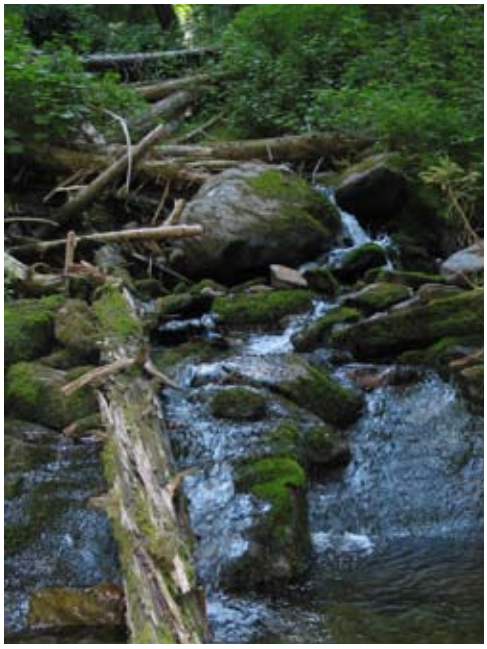

Figure 2. Typical 2nd order steep forested stream (North Fork Second Creek, Lolo National Forest) supporting 3 aquatic SOC in the NRMR.

Figure 3. Headwater 1st order forested stream (trib to Daly Creek, BH-DL Forest) supporting one aquatic SOC in the NRMR.

The US Forest Service (USFS) is required under the National Forest Management Act (1976) and the Code of Federal Regulations (CFR 1985) to maintain the ecosystem diversity of plant and animal species. Aquatic ecosystem protections within the USFS Northern Region managed lands are included in Forest Plan strategies and plan components. These include desired conditions for water quality and riparian conservation areas (RCA), in-stream habitat protections, and the protection of Species of Concern (SOC) and Species of Interest (SOI) (USFS 2006). Comprehensive information and management plans exist for most aquatic vertebrate species of conservation concern (e.g. Bull Trout and Westslope Cutthroat Trout), but the same information is lacking for aquatic invertebrate SOC. Identifying the distribution and habitat requirements of these aquatic invertebrate species is critical to their management and protection because they may inhabit specialized niches not included in the protection plans of vertebrates. We conducted inventories for macroinvertebrate SOC and SOI in 2007 and 2008 within or near USFS lands of Montana and Idaho to compile observation records and create predictive habitat models to better understand the distribution and habitat use of these species. Predictive habitat modeling based on species presence and environmental variables has been used with success in under-surveyed areas for a variety of species (Phillips et al. 2006). We applied Maximum Entropy models (Phillips et al. 2006) to macroinvertebrate SOC within watersheds of the Northern Region in Montana to determine watershed areas with a high likelihood of supporting these populations.

Study objectives were to: 1) more fully document the unique biodiversity that underscores the importance of this Lolo/Clearwater NRMR area and obtain a better understanding of the habitat requirements and distributional status of aquatic invertebrate SOC within USFS Northern Region Lands, 2) update the aquatic invertebrate SOC and SOI lists produced in 2007 with information gathered, 3) use SOC presence data and ecological requirements to create predictive models that can be used to identify stream reaches and watersheds that have the highest potential to contain these sensitive aquatic species, and outline a conservation approach that protects headwater portions of watersheds, retains connectivity among sub-drainages at the 6th code level, and assures well-distributed protected areas across Northern Region forested landscapes.

METHODS

Field Surveys and Laboratory Processing

High-priority stream habitat types were determined prior to conducting field surveys in 2007 and 2008 based on previous field work and SOC macroinvertebrate ecological attribute information compiled in 2006. (Stagliano et al. 2007). A priori determined stream type samples collected by MTNHP in 2006 reported macroinvertebrate SOC presence approximately 56% of the time (Figure 4).

These focal stream types were small (mean wetted-width approximately equal to 1.2 m), steep-gradient (5-15%), headwater-forested streams (Rosgen Type Aa+, A2, A3) with northwest watershed aspects and were predominately fishless. However, surveys were opportunistic and attempts were made to collect samples on the margins of this preferred stream class, including 2nd and 3rd order, lower gradient stream reaches (Rosgen Type B2, B3) and spring seep areas.

Macroinvertebrates were sampled from late-June to early August 2007 and 2008 within the sampling period recommended by MTDEQ (2005). Macroinvertebrates were collected from all in-stream habitats within ten evenly-spaced transects (every 5 or 10 m depending on the length of delineated habitat) with a 500 micron D-frame dipnet following EMAP/BLM protocols as outlined in Lazorchak et al. (1998) (exceptions were 16 Custer National Forest samples collected in the Pryor Mountains in 2008 which utilized an EMAP targeted riffle sampling design and 12 Custer National Forest samples collected within the Ashland District which used an EPA Multi-Habitat Dipnet for Lentic Pools protocols (Barbour et al. 1999). All dipnet jabs or kicks were composited into one sample and organisms were washed onto a 500 micron sieve, transferred to a labeled 1 liter Nalgene bottle, preserved in 95% ethanol, and brought back to the MTNHP lab in Helena for processing. This sampling procedure was demonstrated to additional field technicians (U of M, USFS) in July of 2008, who agreed to collect samples in conjunction with Idaho Giant Salamander surveys. Macroinvertebrate processing for the samples collected by MTNHP followed EMAP protocols with at least 500 organisms examined from each sample. Identification of macroinverte-

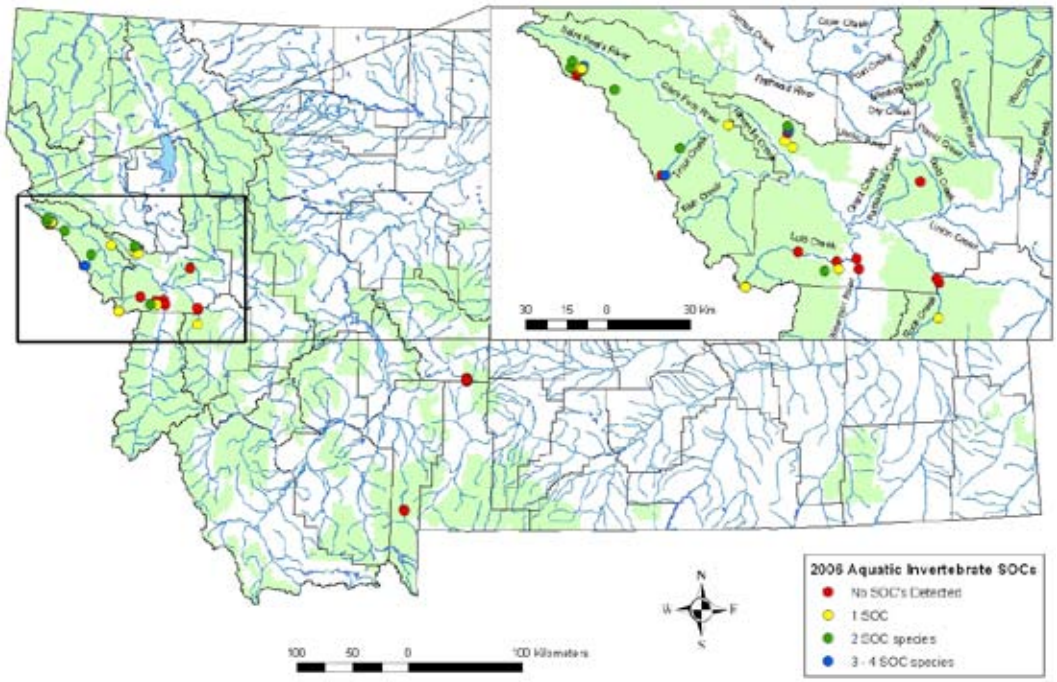

Figure 4. Aquatic macroinvertebrate survey sites with detected SOC sampled in 2006.

brates to species (where possible) was performed with a 10-40x zoom dissecting microscope using the taxonomic references in the Literature Cited. Voucher specimens of all SOC taxa discovered were collected and all non-SOC taxa preserved in 95% ethanol were retained for potential analysis in the future. Caddisfly and stonefly specimens from western Montana were sent to taxonomic experts for verification of species identification. Photos, geographic coordinates, and a variety of in-stream habitat and local site information was recorded at each site (Dugaw et al. 2004) (Appendix B). Survey data have been entered into the Montana Natural Heritage Program Point Observation Database (POD) and Idaho data has been sent to the Idaho Conservation Data Center.

Mussel surveys were conducted on appropriate stream reaches within USFS lands from late-June to September using timed visual surveys (glass-bottomed buckets) following methods in Young et al. (2001). Mussels detected during the visual stream reach search were measured for total length (TL), counted, and released. Dead or relic shells were taken as vouchers.

Predictive Modeling

Predicted distribution models were created in order to: (1) better understand the potential ranges of aquatic SOC in Montana; (2) identify areas that should be targeted for future surveys; (3) determine which environmental variables have the highest predictive association with presence of individual species; and (4) identify spatial patterns in the suitability of habitat for these species. Maxent Version 2.3 (Jaynes 1957; Miroslav et al. 2004; Miroslav et al. 2007; Phillips et al. 2004, 2006; www.cs.princeton.edu/~schapire/maxent/) was used to create predicted distribution models within Montana using 156 mountain and 74 low valley SOC records in the state-wide Point Observation Database (POD) and six continuous (elevation, slope, landscape roughness, annual precipitation, maximum July temperature, minimum January temperature) and five categorical (aspect, geology, 1992 National Land Cover Data, soil temperature class, STATSGO soils) environmental layers (see Hendricks et al. 2008 for descriptions of Environmental Input Layers). The modeling data for the SOC are included in Appendix C and outputs for individual species will be available on the Montana Natural Heritage Program's website http://mtnhp.org. Models will be updated as new environmental layers or observation data becomes available.

Results and Discussion

Overview

A total of 26 aquatic macroinvertebrate samples were collected during 2007 on Northern Region Forests as follows: Beaverhead-Deerlodge (12), Custer (2), Flathead (1), Lewis and Clark (1), and Lolo (10). No samples were collected in Idaho. Nine of the 26 sites had at least one SOC: Beaverhead-Deerlodge (2), Flathead (1), and Lolo (6) (Table 1, Figure 5). Despite focusing on similar stream habitats within and slightly outside the core NRMR area, SOC were only detected in 35% of sites surveyed in 2007. The dominant SOC collected (6 of 9 sites) was the mayfly, *Caudatella edmundsi*.

A total of 92 invertebrate samples were collected during 2008 site visits: Clearwater (48), Custer (28), Lewis and Clark (2), and Lolo (14). In 2008, SOC were detected at 36 of 92 sites (39%) surveyed: Clearwater (24), Flathead (1) and Lolo (11) (Figure 6). Within and slightly outside the core NRMR area, the detection rate for SOC increases to 69% (36 of 52 sites). The dominant SOC collected in 2008 was the mayfly, *Caudatella edmundsi*, which was detected at 18 of 36 or 50% of sites.

The highest diversity of USFS SOC species are found in steep gradient forested headwater streams (12 taxa) and cold mountain springs (6 taxa) (Figure 7).

Surveys and database work initially identified a stonefly new to Montana, *Rickera sorpta* (Perlodidae), in the upper tributaries of Fish Creek on the Lolo National Forest. The species is globally uncommon (G3) and therefore a potential SOC. It was first reported by the Buglab in Logan, Utah from a collection by a PIBO crew in 2004 in the North Fork of Fish Creek. It was reported again in 2006 by Montana DEQ in White and Cache Creeks. The closest known distribution of this stonefly is the Cascades of Washington and Oregon. However, this turned out to be a taxonomic mis-identification of a similar broadly distributed

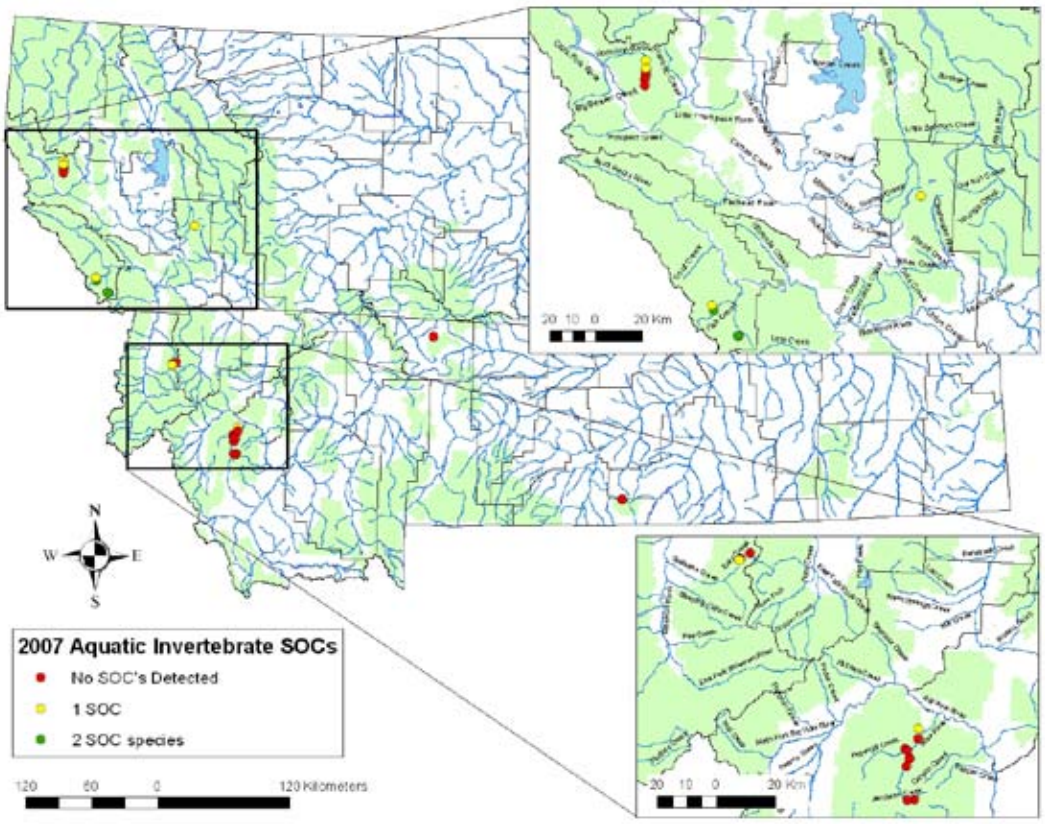

Figure 5. Aquatic macroinvertebrate survey sites with detected SOC sampled in 2007.

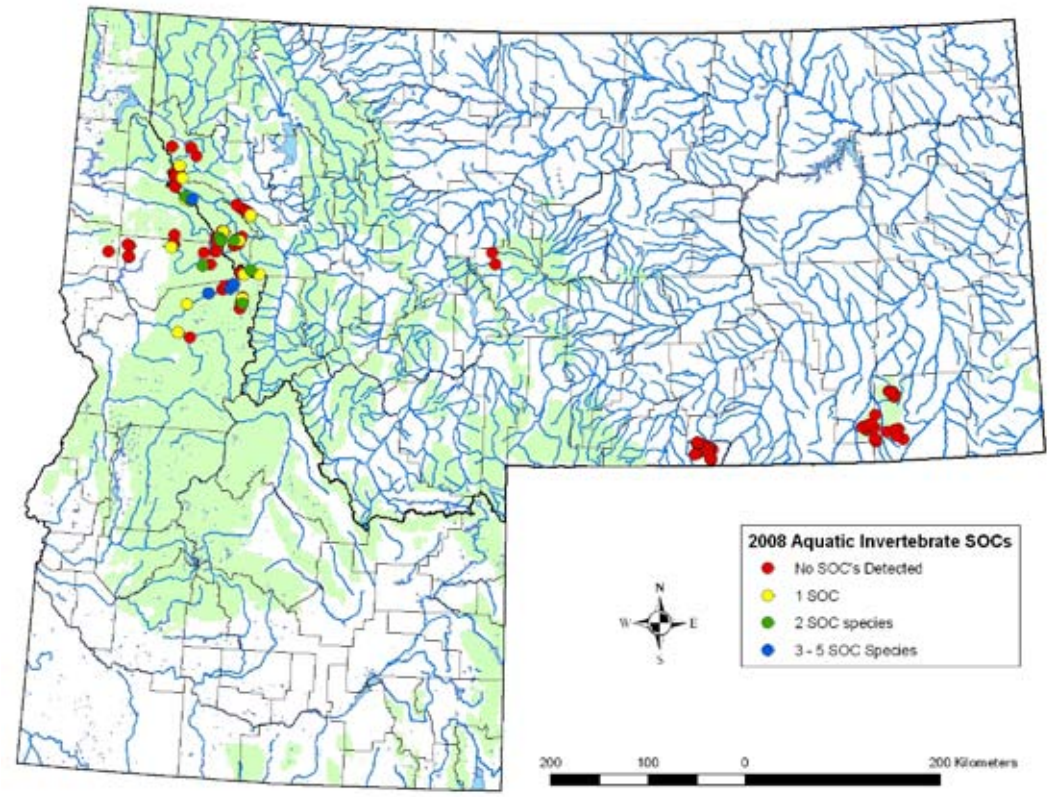

Figure 6. Aquatic macroinvertebrate survey sites with detected SOC sampled in 2008.

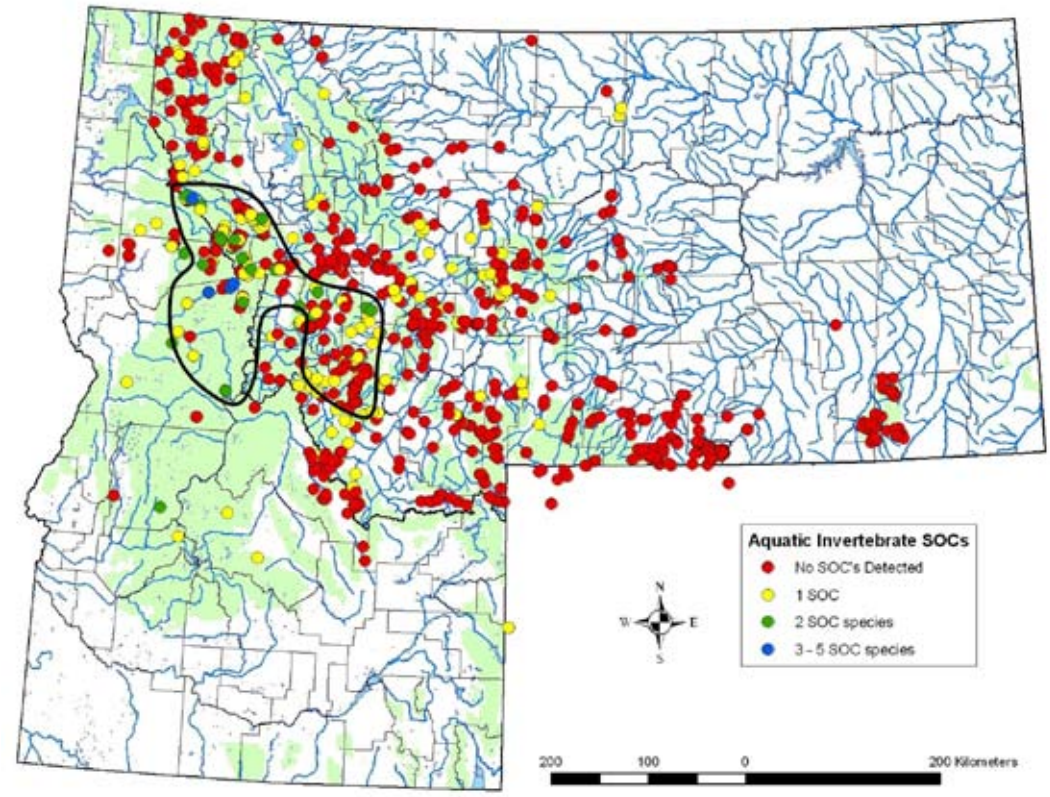

Figure 7. All aquatic macroinvertebrate survey sites compiled for this study in 2008.

Table 1. Macroinvertebrate samples taken by MTNHP and the number of Species of Concern detected during the 2007 field season for the USFS Aquatic Invertebrate SOC project.

Stream	Latitude	Longitude	Land Ownership	County	Collection date	# of SOC species
David Creek[1]	45.53364	-113.03275	USFS BH-DL	Beaverhead	29-Jun-07	0
Fourth of July Creek	45.65883	-113.06054	USFS BH-DL	Beaverhead	28-Jun-07	0
Grouse Creek[1]	45.68687	-113.08568	USFS BH-DL	Beaverhead	28-Jun-07	0
Harriet Lou Creek[1]	45.74889	-113.03010	USFS BH-DL	Beaverhead	28-Jun-07	1
Jacobsen Creek trib #2	45.53110	-113.06364	USFS BH-DL	Beaverhead	29-Jun-07	0
Moose Creek Spring	45.63366	-113.07452	USFS BH-DL	Beaverhead	28-Jun-07	0
Pattengill Creek trib[1]	45.68259	-113.07309	USFS BH-DL	Beaverhead	28-Jun-07	0
Spring Seep 4th of July Creek	45.65830	-113.06203	USFS BH-DL	Beaverhead	28-Jun-07	0
Stine Creek[1]	45.71932	-113.02850	USFS BH-DL	Beaverhead	28-Jun-07	0
Daly Creek trib	46.23762	-113.84276	USFS BH-DL	Ravalli	30-Jun-07	0
Daly Creek trib	46.25572	-113.80291	USFS BH-DL	Ravalli	30-Jun-07	0
Daly Creek trib	46.23273	-113.84638	USFS BH-DL	Ravalli	30-Jun-07	1
Camp Spring Sage Creek	45.20871	-108.53136	USFS Custer	Carbon	13-Jun-07	0
Camp Spring 2 Sage Creek	45.20910	-108.53156	USFS Custer	Carbon	13-Jun-07	0
Beaver Creek[1]	47.38793	-113.66017	USFS Flathead	Missoula	11-Jul-07	1
Fourmile Creek[1]	46.54322	-110.74831	USFS Lewis & Clark	Meagher	02-Aug-07	0
Cache Creek[1]	46.79752	-114.65602	USFS Lolo	Mineral	12-Jul-07	2
Fire Creek[1]	46.88840	-114.80454	USFS Lolo	Mineral	13-Jun-07	2
Straight Creek[1]	46.90910	-114.81919	USFS Lolo	Mineral	16-Jul-07	1
White Creek[1]	46.79570	-114.66279	USFS Lolo	Mineral	13-Jul-07	2
Chilly Creek	47.78800	-115.29654	USFS Lolo	Sanders	27-Jul-07	0
Cold Creek	47.79999	-115.29596	USFS Lolo	Sanders	27-Jul-07	0
Frozen Creek	47.77319	-115.29857	USFS Lolo	Sanders	27-Jul-07	0
Graves Creek Trib	47.75041	-115.29597	USFS Lolo	Sanders	27-Jul-07	0
Vermillion River[1]	47.84757	-115.30053	USFS Lolo	Sanders	27-Jul-07	1
Vermillion River[1]	47.81715	-115.29924	USFS Lolo	Sanders	27-Jul-07	1

[1] =site also searched for *M. falcata*

stonefly, *Kogotus modestus,* initiated by the Buglab and perpetuated by a Montana DEQ contractor. The issue was resolved by sending specimens to a stonefly expert (John Sandberg, pers. comm.).

We do report reports the addition of the caddisfly, *Philocasca banksi* or *Philocasca antennata* to the SOC list and newly reported for Montana in the Updates section.

In 2006 and 2007, 230 *Margaritifera falcata* (western pearlshell mussel) stream surveys were conducted by MTNHP (166 reaches) and others (64 reaches). A subset of these was on streams within USFS boundaries or within 1 km of USFS managed lands (Figure 8). Additional surveys and data compilation in 2008 added 280 more surveys; those that were on or close (~1 km) to USFS managed lands are presented in Figure 9. Between 2006 and 2008, only 18 viable populations were documented in 11 streams (6 exceptional and 12 with good viability). Although western pearlshell populations were detected in almost 80 additional stream reaches, none of these appeared to viable (Figure 9). This high proportion of non-viable mussel populations seems to indicate significant population declines in recent decades. The lack of recent recruitment of this mussel directly correlates to the loss of their host-fish, the westslope cutthroat trout, *Oncorynchus clarki lewisi*, on a majority of Forest Service streams (McIntyre and Rieman 1995).

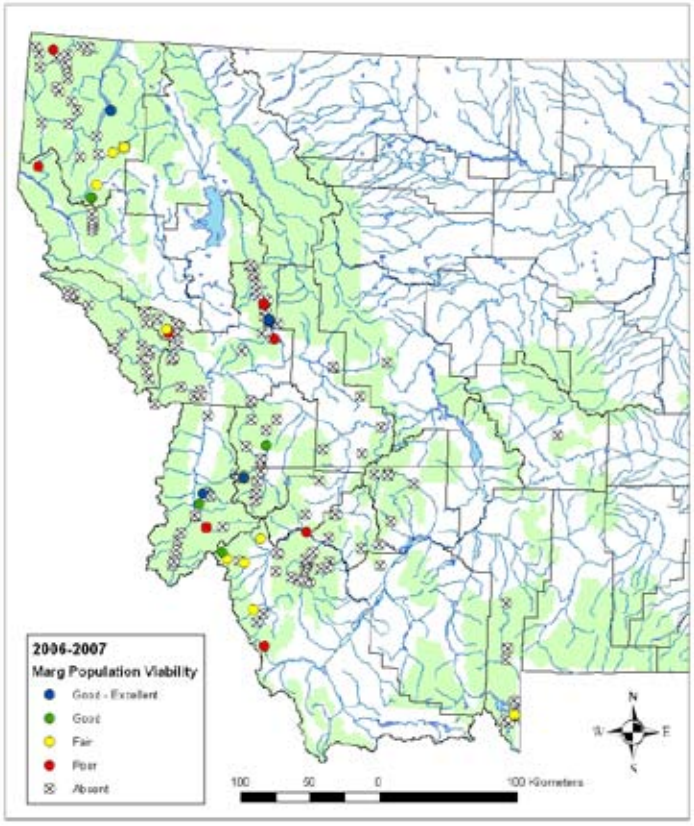

Figure 8. Map of western pearlshell, Margaritifera falcata survey sites and population viability on or within 1 km of USFS owned lands. Data current to 2007.

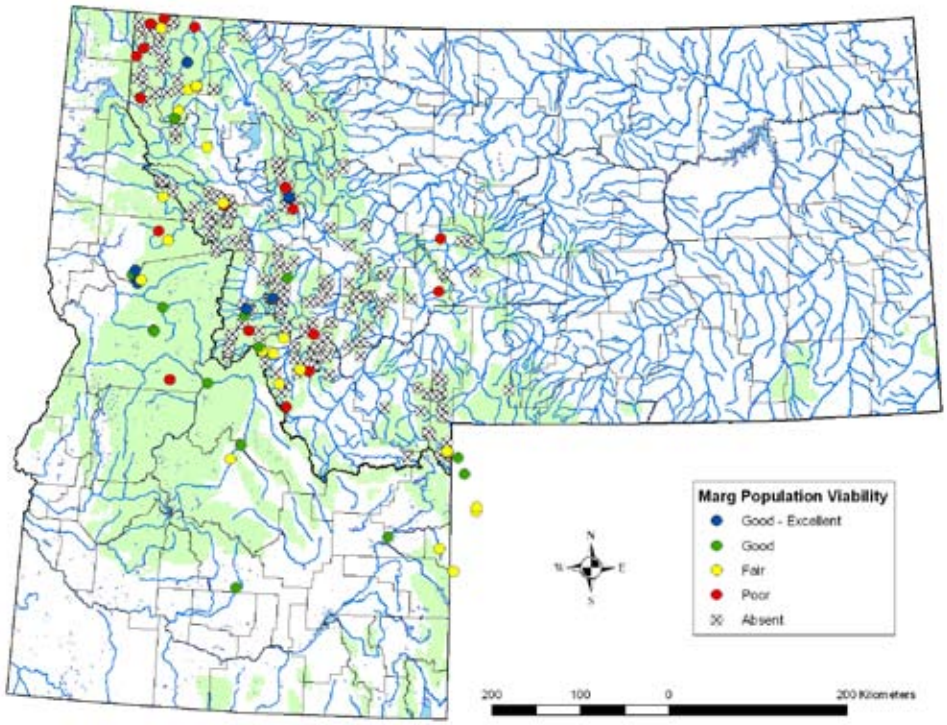

Figure 9. Map of western pearlshell, Margaritifera falcata survey sites and population viability on or within 1 km of USFS owned lands. Data current to 2008.

Northern Region Species (SOC and SOI) Updates

USFS SOC and SOI lists are meant to be dynamic with species added or removed as new information becomes available. Although information on aquatic invertebrates is improving, the taxonomic resolution often is not; identification of the more easily collected larval life history stages is still a challenge when most species level identification is based on adults. Adult insect collections are recommended for "true" taxa inventories, although these can be expensive and time-consuming. There are numerous taxa on these lists (i.e. many Rhyacophilan caddisflies) that belong to species groups that have been collected at numerous USFS sites, but cannot be definitively reported as SOC species because of the possibility of two or more species occurring within the watershed. Multiple species on the SOI list ranked G1-G3 have very limited collection and ecological information, so placing them on the SOC list is premature, especially since NatureServe rankings may be based on only a couple of adult collections.

The USFS Northern Region SOC list has been modified since 2007 to include 21 species; 1 moved to the SOI list and 2 species added (Table 2). The number of documented aquatic invertebrate SOC occurring on Northern Region Forests in Montana is: Beaverhead-Deerlodge (3), Bitterroot (4), Custer (1), Flathead (9), Gallatin (1), Helena (1), Kootenai (1), Lewis and Clark (2), and Lolo (13). The number of documented aquatic invertebrate SOC in Idaho is: Clearwater (11), Idaho Panhandle (2), and Nez Perce (5) (Table 2).

The USFS Northern Region SOI list has been modified since 2007 to include 21 species; 8 were dropped and 2 were added (Table 3). The number of documented aquatic invertebrate SOI on Montana Forests is: Beaverhead-Deerlodge (5), Bitterroot (6), Flathead (8), Gallatin (1), Helena (1), Kootenai (1), Lewis and Clark (1), and Lolo (10). The number of documented aquatic invertebrate SOI on Idaho Forests is: Clearwater (9), Idaho Panhandle (3), and Nez Perce (4) (Table 3).

The patterns of SOC and SOI occurrences are similar to the 2007 study with more species of conservation concern occurring in the Lolo, Clearwater and Flathead National Forests. Aquatic invertebrates that should be strongly considered by the USFS Northern Region in any forest management plan includes 21 SOC (Table 2) and 21 SOI (Table 3); background on some of the additions to and deletions from these lists are presented in the next section. Predictive models were derived for a subset of the species on these lists based on data mostly collected during the last three years (Table 4) and appear within the text of the species modeled. Records to derive the models were spatially unique and had a locational uncertainty of ≤ 400 meters. Hotter colors on the maps (reds) indicate areas predicted to have more suitable habitat for the species. Black dots are observations used to build the models.

Table 4. Macroinvertebrate species modeled for the USFS Aquatic Invertebrate SOC project with Maxent, total Montana occurrence records and the number of records suitable for modeling.

Species	Total MT POD Records	No. Maxent Records
Agapetus montanus	134	104
Caudatella edmundsi	70	61
Caurinella idahoensis	6	6
Goereilla baumanni	3	3
Rhyacophila potteri	13	13
Rossiana montana	8	8
Sericostriata surdickae	22	18
Soliperla salish	5	5
Soyedina potteri	10	9
Zapada cordillera	6	2

Table 2. List of 2009 Aquatic Invertebrate Species of Concern (SOC) for consideration by the USFS Northern Region.

			Montana Forest[a]									Idaho Forest[b]		
Common Name	**Scientific name**	**G-Rank**	**B-D**	**BI**	**CU**	**FL**	**GA**	**HE**	**KO**	**L-C**	**LO**	**CL**	**I-P**	**N-P**
Sponge														
A Freshwater Sponge	*Ephydatia cooperensis*	G1G3				?				?	X			
Caddisflies														
An Agapetus Caddisfly	*Agapetus montanus*	G3	X	X	X	X	X	X	X	X	X	?		X
Alexander's Rhyacophilan	*Rhyacophila alexanderi*	G2		X		?				?	X			
A Rhyacophilan Caddisfly	*Rhyacophila newelli*	G3	?			?				?	X			
NRMR Caddisfly*	*Philocasca banksi*	G1G3							?		X	X		
NRMR Caddisfly*	*Philocasca antennata*	G1G3									X	X	X	
NRMR Caddisfly	*Sericostriata surdickae*	G2G3	X	X							X	X		X
NRMR Caddisfly	*Rossiana montana*	G2G3				X					X	X		
NRMR Caddisfly	*Goereilla baumanni*	G2				X					X	?		
Stoneflies														
A Stonefly	*Pictetiella expansa*	G3				X			?	?	?	X	X	X
A Stonefly	*Soyedina potteri*	G2				X					X	X		
Clearwater Roachfly	*Soliperla salish*	G2									X	X		
A Stonefly	*Taenionema umatilla*	G3										X		
A Stonefly	*Zapada cordillera*	G3				X				X	X	X		
Mayflies														
Lolo Mayfly	*Caurinella idahoensis*	G1G3									X	X		
A Mayfly	*Parameletus columbiae*	G2				X						X		
Freshwater Snails														
Pristine Pyrg	*Pristinicola hemphilli*	G3												X
Shortface Lanx	*Fisherola nuttalli*	G2												X
Longmouth Pondsnail	*Stagnicola elrodiana*	G1	X			X								
Shortspire Pondsnail	*Stagnicola idahoensis*	G1												X
Mountain Marshsnail	*Stagnicola montanensis*	G3		X		X								
Total SOC			**3**	**4**	**1**	**9**	**1**	**1**	**1**	**2**	**13**	**11**	**2**	**5**

[a] MT Forests codes: Beaverhead-Deerlodge (B-D), Bitterroot (BI), Custer (CU), Flathead (FL), Gallatin (GA), Helena (HE), Kootenai (KO), Lewis and Clark (L-C), Lolo (LO).

[b] Idaho Forest codes: Clearwater (CL), Idaho Panhandle (I-P), Nez Perce (N-P).

* new species for Montana SOC list

? = Potential to occur in this forest, but not verified or recorded on USFS Northern Region lands

Table 3. List of 2009 Aquatic Invertebrate Species of Interest (SOI) for consideration by the USFS Northern Region.

			Montana Forest[a]									Idaho Forest[b]		
Common Name	**Scientific name**	**G-Rank**	**B-D**	**BI**	**CU**	**FL**	**GA**	**HE**	**KO**	**L-C**	**LO**	**CL**	**I-P**	**N-P**
Freshwater Mussel														
Western Pearlshell	*Margaritifera falcata*	**G4G5**	**X**	**X**		**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**
Caddisflies														
An Caddisfly	*Apatania comosa*	**G2G3**		**X**						**?**	**X**	**?**		**X**
An Caddisfly	*Arctopora salmon*	**G1G3**										**?**	**?**	
An Caddisfly	*Cryptochia furcata*	**G3G4**				**?**					**X**		**?**	
An Caddisfly*	*Glossosoma idaho*	**G2G3**	**?**	**?**								**?**		**X**
A Rhyacophilan Caddisfly	*Rhyacophila gemona*	**G2G3**				**X**							**?**	
A Rhyacophilan Caddisfly	*Rhyacophila potteri*	**G3**	**X**	**X**		**X**					**X**	**X**		
A Rhyacophilan Caddisfly*	*Rhyacophila unimaculata*	**G2G3**				**X**							**?**	
Stoneflies														
A Stonefly	*Bolshecapnia sasquatchi*	**G3**				**X**					**X**			
Straight Stonefly	*Capnia lineata*	**G3**										**X**	**?**	
A Stonefly	*Capnia zukeli*	**G2**										**X**	**?**	
Cascades Stripetail	*Cascadoperla trictura*	**G3G4**									**X**	**X**	**?**	
A Spring Stonefly	*Malenka tina*	**G3**	**?**									**?**		**?**
A Stonefly	*Megaleuctra kincaidi*	**G2**		**?**							**?**	**X**	**?**	
A Stonefly	*Megaleuctra stigmata*	**G2**				**?**					**?**	**?**	**?**	
A Stonefly	*Setvena bradleyi*	**G3**	**X**	**X**		**X**					**X**	**X**	**X**	
Mayflies														
A Mayfly	*Caudatella edmundsi*	**G3G4**	**X**	**X**		**X**					**X**	**X**	**X**	**X**
A Mayfly	*Paraleptophlebia jenseni*	**G2G4**										**X**	**?**	
Freshwater Snails														
Large Mantled Physa	*Physa megalochlamys*	**G3**				**X**				**?**	**X**		**?**	
Rocky Mountain Capshell	*Acroloxus coloradensis*	**G3**	**?**	**?**		**?**								
Rocky Mountain Duskysnail	*Colligyrus greggi*	**G4**	**X**	**X**							**X**			
Total SOI			**5**	**6**	**0**	**8**	**1**	**1**	**1**	**1**	**10**	**9**	**3**	**4**

[a] MT Forests codes: Beaverhead-Deerlodge (B-D), Bitterroot (BI), Custer (CU), Flathead (FL), Gallatin (GA), Helena (HE), Kootenai (KO), Lewis and Clark (L-C), Lolo (LO).

[b] Idaho Forest codes: Clearwater (CL), Idaho Panhandle (I-P), Nez Perce (N-P).

* new species for Montana SOC list

? = Potential to occur in this forest, but not verified or recorded on USFS Northern Region lands

Species Added in 2009

***Philocasca banksi* (Denning 1941). A Caddisfly: NatureServe Global Status: G1G3.**
***Philocasca antennata* (Banks 1900). A Caddisfly: NatureServe Global Status: G1G3.**

These species, which have not been described as larvae (see figure 10, 9 – "Ph. sp." could be either species), were absent from the 2007 SOC list, but will be included on the 2009 SOC list because they appear to be rare, are infrequently collected, and are more highly habitat specific than other species found in the NRMR area of Montana and Idaho. Wiggins and Anderson (1968) describe a larva collected from Idaho that could either be *Philocasca antennata* or *Philocasca banksi,* since both species have the potential to be collected in the region. This species' case is a fairly straight, uniform width, small-rock tube case (Figure 10). This reported larva was collected in loose gravel in the stream bed of a 2-4ft wide, low gradient, conifer-forested stream. These species must be truly rare or habitat limited / specific because even after focusing on these headwaters streams for several years and with almost 90 sites in the NRMR Lolo National Forest area, the 2008 records are the 1st and 2nd records for any *Philocasca*.

Larvae of this genus have been known to spend part of their life cycle terrestrially, leaving the stream channel during cooler wetter seasons and ranging across the forest floor (Anderson 1967)

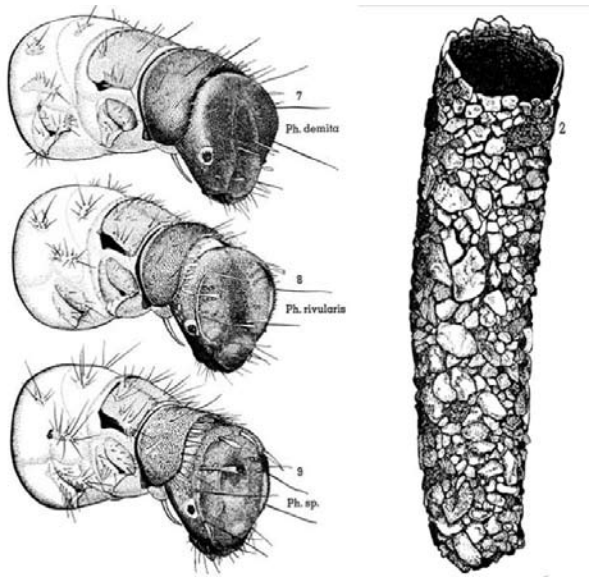

Figure 10. Diagram of new SOC caddisfly, Philocasca banksi or P. antennata (taken from Wiggins and Anderson (1968).

and returning to the stream channel when the forest floor dries out. This study collected *Philocasca* larvae in 2008 from 5 sites on the Lolo National Forest (tributaries to Deer and Trout Creek, and East Fork Crow Creek a tributary to Prospect Creek) that were small, forested springs/streams, approximately 0.5-1 m wide, that had a dense coniferous canopy, a low to moderate gradient, and cold water temperatures and mineral substrates dominated by clean gravel. Both species of *Philocasca* are expected to occur on USFS Northern Region Lands in Idaho, while *P. banksi* should solely occur in Montana (Figure 11).

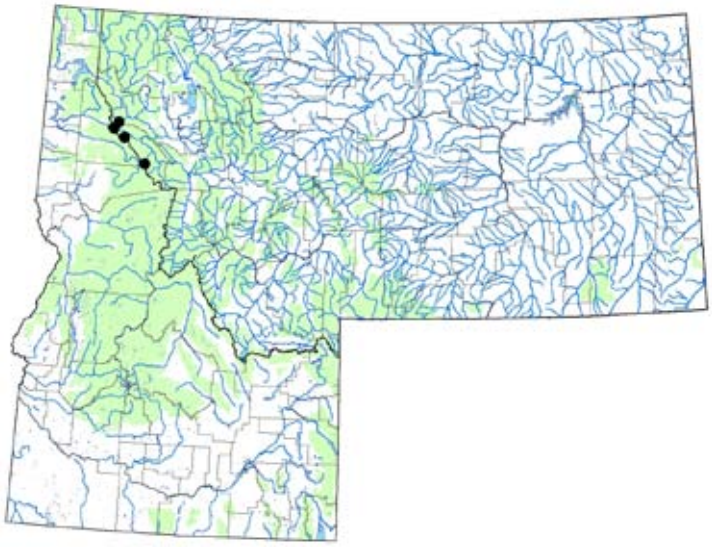

Figure 11. USFS Northern Region Distribution for the caddisfly, Philocasca banksi.

***Glossosoma idaho* Ross 1941. A Caddisfly**
NatureServe Global Status: G2G3
This species, which has not been described as a larvae, was absent from the 2007 SOI list, but will be included on the 2009 SOI list because it is rare, infrequently collected, and reported to be in Idaho and Montana. In Idaho it has been reported from Falls River in Fremont Co. and Gooding Co. at Niagara Springs (Newell and Minshall 1977), Indicating the species occurs in the Targhee National Forest, but not the Nez Perce National Forest. It also is reported to occur in Montana (Gustafson 2009, Clemson Univ. 2002), but no specific location was noted. Presumably it would occur in the Gallatin or Beaverhead-Deerlodge National Forest in southwestern Montana. This caddisfly occurs in larger open canopied mountain streams which will be the focus of future sampling efforts.

Species Dropped from SOI List in 2009

***Paraleptophlebia traverae* McCafferty & Kondratieff 1999. A Mayfly.**
NatureServe Global Status: GH
This species, known from one specimen in Idaho, was on the SOI list as GH (possibly extinct) in 2007 and is now believed to be a relic species (McCafferty, pers comm.) and should be removed from the SOI list.

***Allomyia bifosa* (Ross 1950). A Caddisfly.**
NatureServe Global Status: G3G4
This species, known only from records in Glacier National Park (Iceberg Lake; see Newell and Potter 1973), Revelstoke National Park in British Columbia (Mt. Thornhill; see Nimmo and Scudder, 1978), and Alberta was listed on the SOI list as G3G4 in 2007. However, it will be removed this year because in Montana, no information indicates that this species would be found outside of snow-melt alpine streams in Glacier National Park (Giersch and Hauer 1999).

***Caudatella jacobi* (McDunnough 1939). A Mayfly.**
NatureServe Global Status: G3G4
This species was on the SOI list as G3 in 2007, but is now ranked a G3G4 (NatureServe 2009). It will be removed in 2009 because this species is peripheral to and may not even be present on USFS Northern Region Lands. Formerly known as *Ephemerella orestes* or *Caudatella orestes*, it was listed in the MT DEQ database, but with no location records. Gustafson (2009) does not list this species as occurring in Montana. It was mistakenly reported present in the Beaverhead-Deerlodge, Lolo and Clearwater National Forests (Stagliano et. al 2007) based on sites with *Caudatella edmundsi*. Randolph (2002) lists Montana within the distribution, but no records can be verified and Idaho has never reported this species being present, making their presence in Montana an unlikely disjunct occurrence.

***Perlomyia collaris* Banks 1906. Black Needlefly.**
NatureServe Global Status: G3
This species was on the SOI list as G3 in 2007, but should be removed because its distribution is peripheral to USFS Northern Region lands and is, therefore, less relevant to management plans. It was mistakenly reported as occurring in the Nez Perce National Forest in the 2007 report, when, in fact, it was found in Cottonwood Creek, Nez Perce County which is on privately-owned lands and a very small (< 400 m) area of BLM lands.

***Stagnicola elrodi* Baker & Henderson 1933. Flathead Pondsnail**
NatureServe Global Status: G1Q
This species was on the SOI list as G1 in 2007, but should be removed due to the lack of potential overlap with USFS management actions involving this taxon. Additionally, there is some question as to the validity of this taxon (Q in the NatureServe Rank). Hubendick (1951) considered it to be a synonym of *Lymnaea* (= *Stagnicola*) *emarginata* but later work (Burch 1989) places it as a valid species in the *emarginata* group. Turgeon et al. (1998) recognizes it as a valid species. Regardless, it is known from only Flathead Lake in Montana, despite extensive searches elsewhere by R. Brunson (T. Frest pers. comm. 2000).

Species Downgraded Since 2007 (Less Vulnerable)

***Margaritifera falcata* (Gould 1850). Western Pearlshell.**

NatureServe Global Status: G4G5 (G3G4 in 2007), but MTNHP S2 (S2S4 in 2007)

This species was on the SOI list as G3G4 in 2007, but is now ranked a G4G5. Despite the new rank, this species should remain on the SOI list because Montana's populations are in serious decline as indicated by the new state ranking of S2 in 2008 (MTNHP 2009) which may lead to changing this species global rank back to a G4. More populations are being reported, but many are not viable (old individuals, non-recruiting populations); 80 sites in Montana and Idaho fall into this category (see Figs. 8 & 9).

***Ameletus sparsatus* McDunnough 1931. A Mayfly.**

NatureServe Global Status: G4 (G3G4 in 2007)

This species was listed on the SOI list as G3G4 in 2007, but is now ranked a G4 and should be removed from the SOI list. It occurs in California, Colorado, Montana, Idaho, Alberta, and British Columbia and is fairly common, except in MT where we only have 3 stream records; 2 were added in 2008, but neither are on USFS lands). Several new localities were recently found in California, Oregon, and Washington which greatly expanded their known global distribution (Meyer and McCafferty 2008).

***Ameletus suffusus* McDunnough 1936. A Mayfly.**

NatureServe Global Status: G4 (G2G4 in 2007)

This species was on the SOI list as G2G4 in 2007, but is now ranked a G4 and should be removed from the SOI list. The species occurs in Idaho, Montana, Washington, Oregon, California, Alberta, and British Columbia and is only uncommon in Montana and Idaho where only two stream records exist (Montana record from the Middle Fork Flathead River, Flathead Co. added in 2007) (McCafferty and Newell 2007; IDCDC 2006). Several new localities were recently found in California, Oregon and Washington which greatly expanded their known global distribution (Meyer and McCafferty 2008).

***Caudatella edmundsi* (Allen 1959). A Mayfly. NRMR Mayfly in Montana and Idaho**

NatureServe Global Status: G3G4 (G1G3 in 2007)

This species was on the SOC list as G1G3 in 2007, but is now ranked a G3G4 and should be placed on the SOI list. There are several reasons for downgrading this species. Forty-eight new USFS Northern Region localities were added during the last three years of sampling (70 total sites) (Figure 12). Several new localities were found in California, Oregon, and Washington that greatly expanded their known global distribution (Hogue and Hawkins 2008). They also report this species in 15 new Idaho locations and from four streams draining the western slope of the central and southern Sierra Nevada of California (Hogue and Hawkins 2008). It was previously known only from the coastal ranges of western Oregon and California and from disjunct Idaho and Montana populations (Stagliano et al. 2007). Jacobus et al. (2006) also indicate their presence in Montana (Sanders Co.) and Washington.

The predicted distribution model for the NRMR Mayfly *Caudatella edmundsi* was trained with 61 presence records as presented in Figure 13.

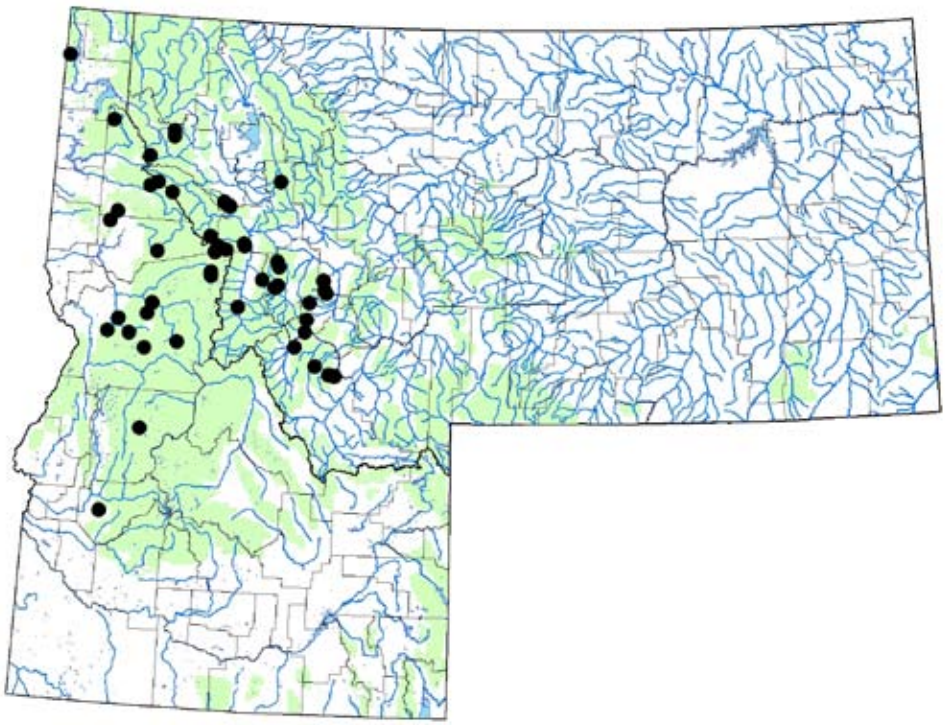

Figure 12. USFS Northern Region Distribution for the mayfly, Caudatella edmundsi.

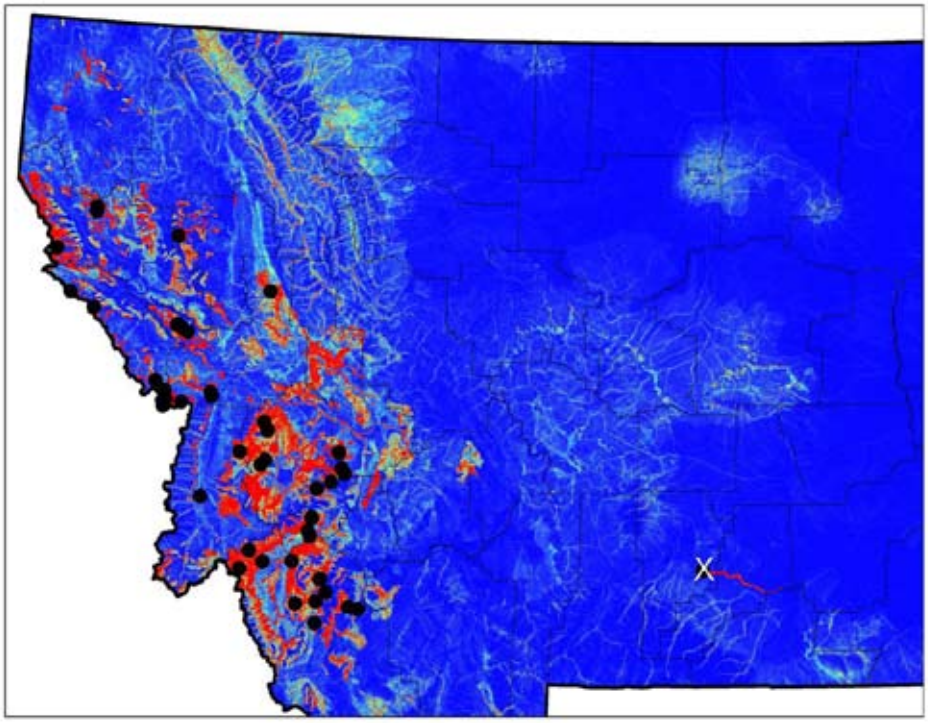

Figure 13. Predictive Distribution Model Output Map for the mayfly, Caudatella edmundsi.

***Sericostriata surdickae* Wiggins, Weaver and Unzicker 1985**

NatureServe Global Status: G2G3 (G1G3 in 2007)

This species was on the SOC list as G1G3 in 2007, but is now ranked a G2G3 largely due to our sampling and data compilation efforts in 2006 and 2007 (Stagliano et al. 2007). This species will remain on the SOC list, but at a less vulnerable status. Thirteen new USFS Northern Region stream sites were added during the last three years of sampling.

The predicted distribution model for NRMR Caddisfly, *Sericostriata surdickae* was trained with 18 observation records. The predictive distribution model for this species shows a high likelihood of occurrence for this species in previously undocumented areas, including the Lewis and Clark National Forest (Scapegoat and Bob Marshall Wilderness areas) and the Big Belt Mountains (Figure 14).

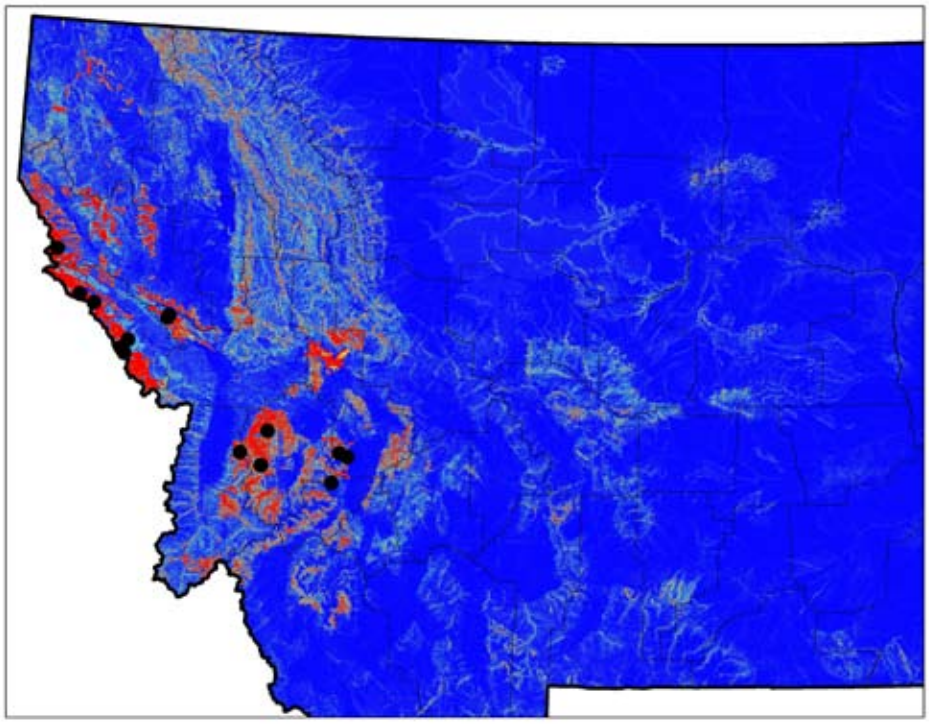

Figure 14. Predictive Distribution Model Output Map for the caddisfly, Sericostriata surdickae.

***Rhyacophila potteri* Denning 1971. A Rhyacophilan Caddisfly.**

NatureServe Global Status: G3 (G1G2 in 2007)

This species was on the SOI list as a G1G2 in 2007, but is now ranked a G3 and will remain on the SOI list. In Montana, this species has been collected from Lolo Pass, Lost Trail Pass, and Skalkaho Pass areas of Idaho and Montana. Metamorphotypes and adults have also been collected from the Pioneer and Tobacco Root Mountains of Montana. Larvae occur in small streams or seeps with abundant mosses. Larval-adult associations were first made from pupae reared from a small cobble bottomed stream draining a spring- fed marsh that runs below a roadcut in the Mule Creek drainage of the Pioneer Mountains. The moss *Amblystegium riparium* is abundant along the bottom and margins of the stream, and pupae were collected from within the moss mats, with the mosses tightly wrapped around the cocoons (Giersch, 2002).

Giersch (2002) documents occurrences in the Alberta type locality; Idaho Co., Idaho; Beaverhead, Flathead, Granite, Madison, Missoula, and Ravalli Co., Montana. The global short term trend appears to be increasing (increase of >10%, NatureServe 2009). Further collecting, as well as the discovery of more museum specimens indicates that the distribution of *R. potteri* is more extensive than previously thought, extending eastward at least as far as the Tobacco Root Mountains of Montana. It is likely that *R. potteri* has a continuous distribution along the Montana-Idaho border north to British Columbia and Alberta (Giersch, 2002). The predictive distribution model supports this with predicted areas including the Gallatin and Lewis and Clark National Forests (including the Big Belt Mountains and Scapegoat and Bob Marshall Wilderness areas), as well as a high likelihood of occurrence in the Cabinet Mountains on the Kootenai National Forest (Figure 15). The predicted distribution model was trained with 13 presence records.

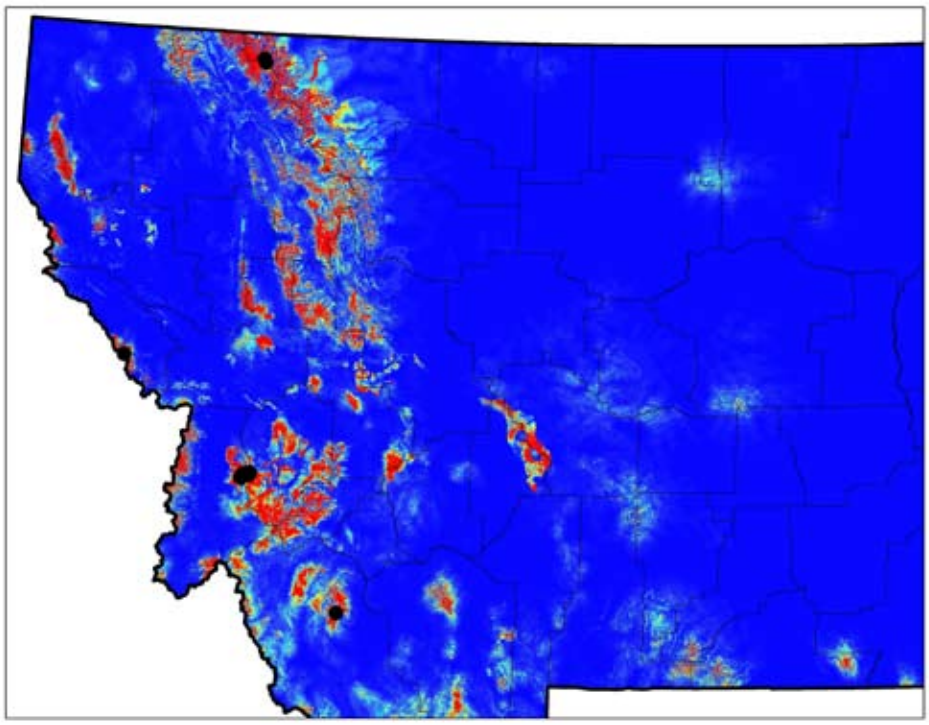

Figure 15. Predictive Distribution Model Output Map for the caddisfly, Rhyacophila potteri.

Species Expected to be Downgraded

***Setvena bradleyi* (Smith 1917). Alberta Springfly.**

NatureServe Global Status: G3.

This species was listed as a SOI stonefly in 2007 and is usually associated with small cold streams and springs. In 2005, it was known from approximately 30 occurrences from Alberta, British Columbia, Oregon, Idaho, and Montana. Sampling and data compilation in the last three years have almost tripled the number of occurrences in Montana and Idaho. It will likely be downgraded to a G4 and taken off the SOI list in the next year. However, it remains an important indicator species because of its association with cold, high quality streams in conjunction with other SOC taxa such as *Sericostiata surdikae, Soliperla salish* and *Caurinella idahoensis*.

***Paraleptophlebia vaciva* (Eaton, 1884). A Mayfly.**

NatureServe Global Status: G3G4.

This species was not included on the USFS Northern Region SOI list in 2007. This is a northwestern species currently known only from male adults, and thus appears to warrant the current preliminary ranking. However, it may eventually be ranked as high as G5 (NatureServe 2009) when reliable identification keys to the larvae are developed and species identification is required in bioassessment sampling protocols.

Species Upgraded (More Vulnerable)

***Goereilla baumanni* Denning 1971. A NRMR Caddisfly.**

NatureServe Global Status: G2 (G2G3 in 2007).

This caddisfly continues to be a rare SOC on USFS Northern Region lands, because it is habitat specific, associated with headwater springs and seeps, and is always reported in very low abundance (Stagliano et al. 2007). In 2007, it was known from only six occurrences in Idaho and Montana, and no new records were added in recent surveys. The predicted distribution model for NRMR Caddisfly, *Goereilla baumanni*, was trained with three observation records (Figure 16).

The predicted distribution model for this species indicates potential occurrence on the Lewis and Clark National Forest, including the Scapegoat and Bob Marshall Wilderness areas and the Big Belt Mountains.

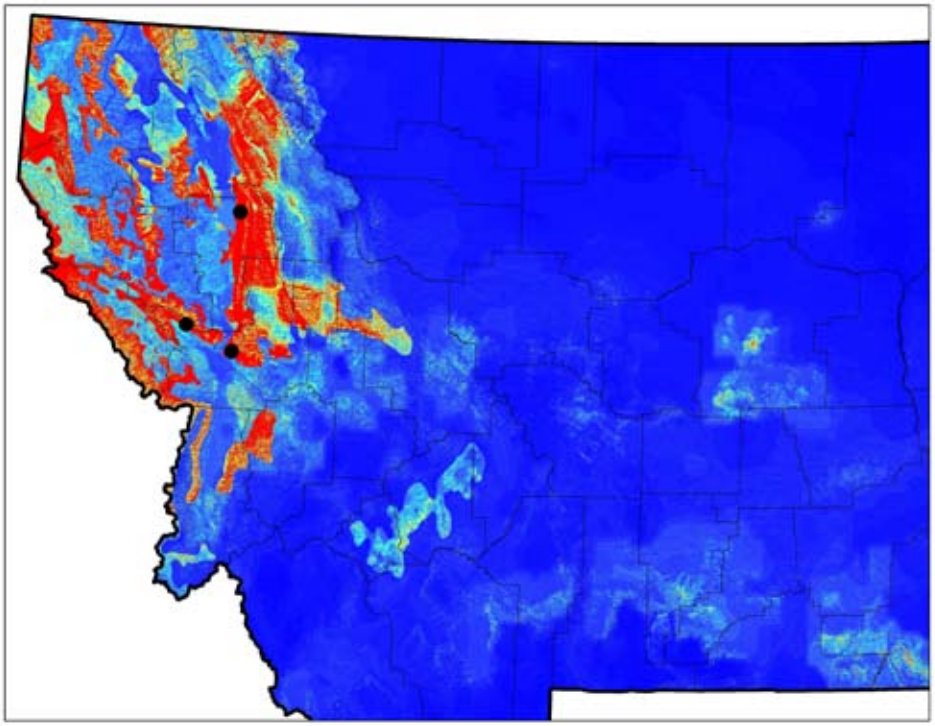

Figure 16. Predictive Distribution Model Output Map for the caddisfly, Goereilla baumanni.

***Soyedina potteri* (Baumann & Gaufin 1971). A NRMR Stonefly.**

NatureServe Global Status: G2 (G2G3 in 2007). This stonefly continues to be a rare SOC on USFS Northern Region lands because it is habitat specific, associated with headwater springs and seeps, and is always reported in very low abundance (Stagliano et al. 2007). In 2007, it was known from only six occurrences in Idaho and Montana, and only 10 new records were added during recent surveys. The predicted distribution model for the NRMR Stonefly, *Soyedina potteri* was trained with nine 9 Montana observation records (Figure 17).

The predicted distribution model for this species shows potential new sites with high likelihood of occurrences on the Lewis and Clark National Forest, including the Scapegoat and Bob Marshall Wilderness areas, Rocky Mountain Front, and Big Belt Mountains.

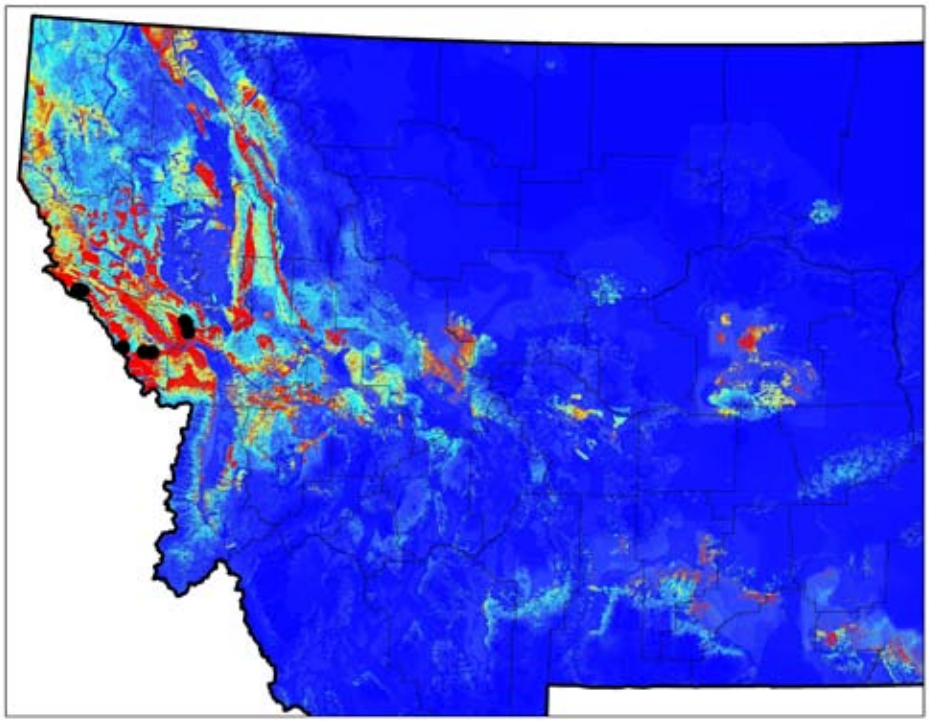

Figure 17. Predictive Distribution Model Output Map for the stonefly, Soyedina potteri.

Species Unchanged (With Additional Distribution Data)

Rossiana montana **NRMR Caddisfly.**

NatureServe Global Status: G2G3

This caddisfly continues to be a rare SOC on USFS Northern Region lands. In 2007, it was known from only six occurrences in Idaho and Montana. Only 2 records were added during recent surveys. The predicted distribution model for *Rossiana* was trained with eight observation records (Figure 18).

Although the predicted distribution model for this species shows potential new sites with high likelihood of occurrences on the Lewis and Clark National Forest (Scapegoat and Bob Marshall Wilderness areas, Rocky Mountain Front, and Big Snowy Mountains) and Kootenai National Forest up into Glacier National Park, it is believed this endemic genera is restricted to the NRMR area of Montana and Idaho.

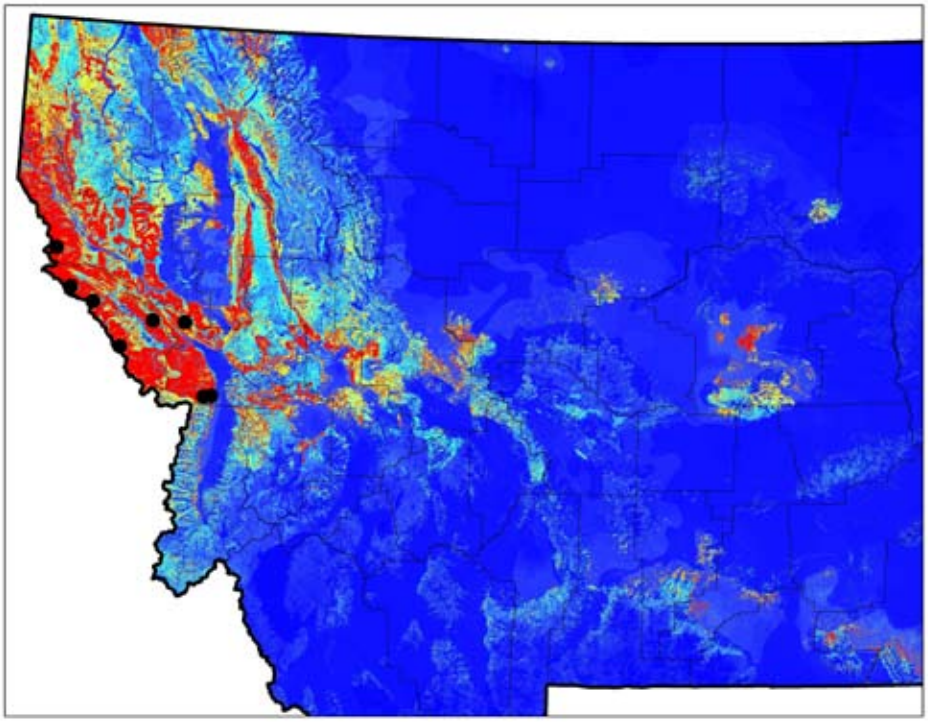

Figure 18. Predictive Distribution Model Output Map for the caddisfly, Rossiana montana.

Agapetus montanus **An Agapetus Caddisfly.**
NatureServe Global Status: G3
This caddisfly continues to be an often collected SOC on USFS Northern Region lands. In 2007 it was known from about 145 occurrences in Idaho and Montana. Although unchanged since 2007, it will likely be downgraded in the near future given the number of occurrence records compiled and the abundance of individuals at most sites. The predicted distribution model for *Agapetus montanus* was trained with 134 observation records (Figure 19). This species is well distributed across most National Forest and BLM lands in Montana at lower elevations and lower stream gradients. They are also predicted to occur in the Bitterroot Valley, but observation records are currently lacking.

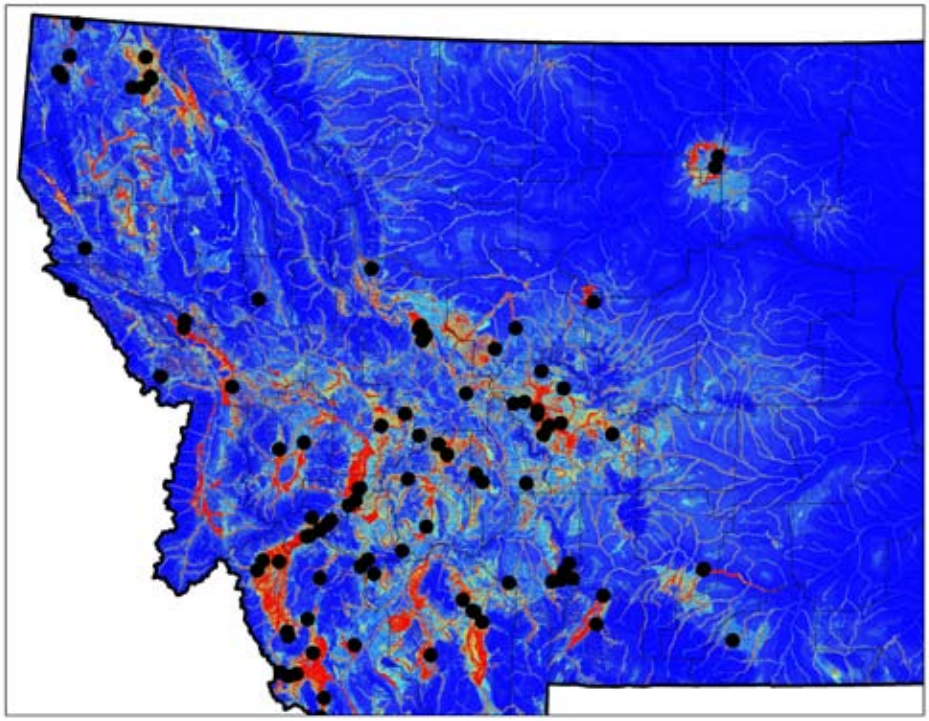

Figure 19. Predictive Distribution Model Output Map for the caddisfly, Agapetus montanus.

Caurinella idahoensis **NRMR Lolo Mayfly.**
NatureServe Global Status: G1G3

This mayfly continues to be a rare SOC on USFS Northern Region lands. In 2007, it was known from only six occurrences in Idaho and Montana. Only 4 new records were added during recent surveys. The predicted distribution model for the Lolo Mayfly was trained with six observation records (Figure 20).

Although the predicted distribution model for this species shows potential new areas with high likelihood of occurrence in the Lewis and Clark National Forest (Scapegoat and Bob Marshall Wilderness, Rocky Mountain Front, and Big Snowy Mountains), as well as the Kootenai National Forest and up into Glacier National Park, it is believed this endemic genera is restricted to the NRMR area of Montana and Idaho.

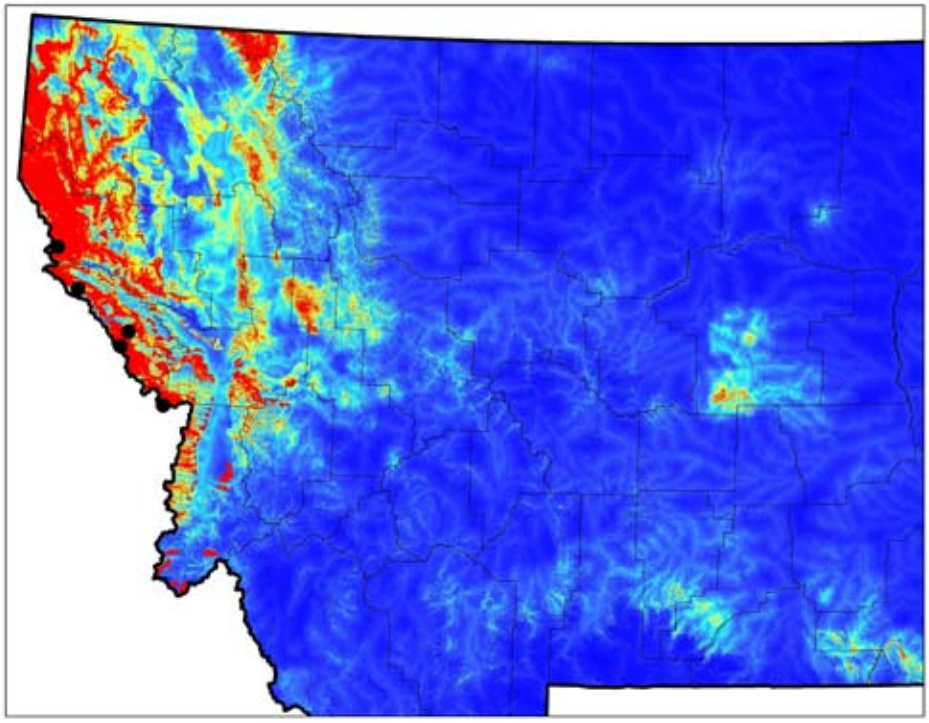

Figure 20. Predictive Distribution Model Output Map for the mayfly, Caurinella idahoensis.

Soliperla salish **NRMR Stonefly.**
NatureServe Global Status: G2

This stonefly continues to be a rare SOC on USFS Northern Region lands. In 2007, it was known from only six occurrences in Idaho and Montana. Only four new records were added during recent surveys. The predicted distribution model for this NRMR Stonefly was trained with six observation records (Figure 21).

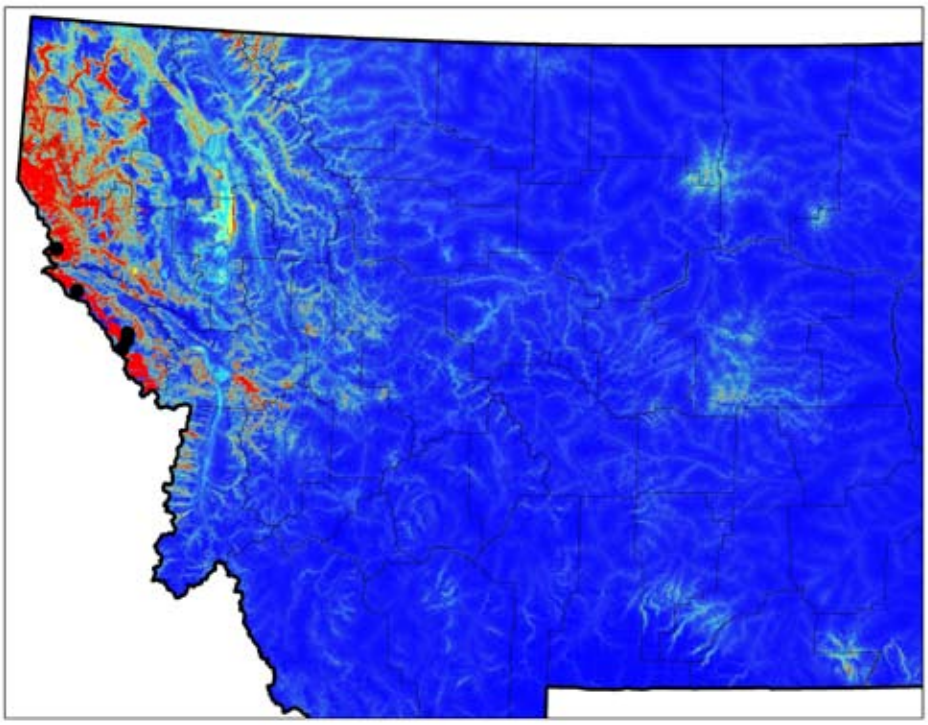

Figure 21. Predictive Distribution Model Output Map for the Clearwater Roachfly, Soliperla salish.

Zapada cordillera **NRMR Stonefly.**
NatureServe Global Status: G3
This stonefly continues to be a rare SOC on USFS Northern Region lands. In 2007, it was known from only nine occurrences in Idaho and Montana and no new records were added during recent surveys. Because this species' larvae are not described within the *Zapada oregonensis* group, it may be collected without the ability to confirm its presence. Therefore, it may be more broadly distributed than currently recognized (Figure 22).

The predicted distribution model for this stonefly was trained with six observation records in Montana (the Idaho records were not used). Records used for modeling were spatially unique and had locational uncertainties of ≤400 meters. The predicted distribution model for this species shows potential areas of occurrence, including the Lewis and Clark National Forest (Scapegoat and Bob Marshall Wilderness areas and Rocky Mountain Front) as well as in the Cabinet Mountains in western Montana (Figure 23).

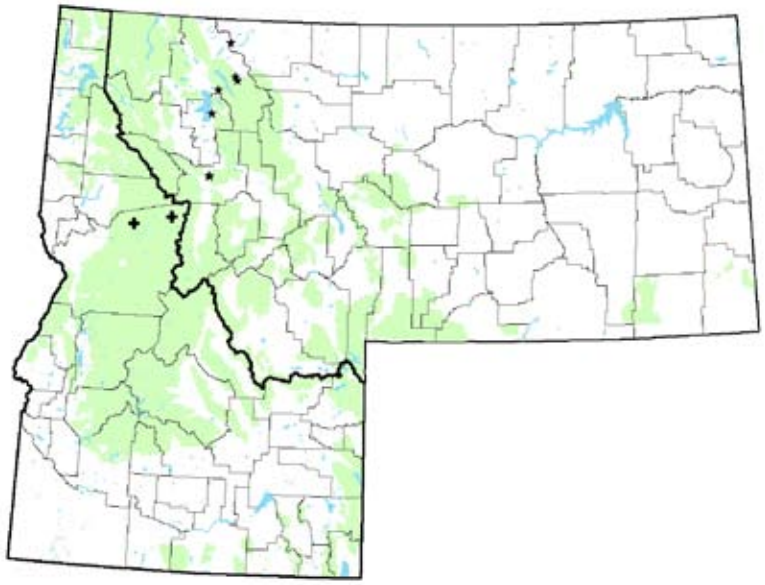

Figure 22. USFS Northern Region Distribution for the stonefly, Zapada cordillera.

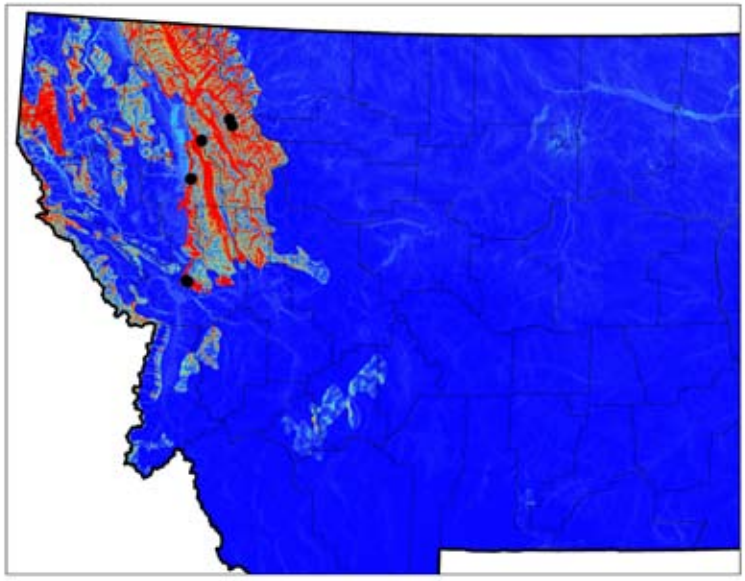

Figure 23. Predictive Distribution Model Output Map for the stonefly, Zapada cordillera.

Conclusions and Recommendations

A significant number of additional aquatic invertebrate SOC stream locations were documented during the 2007 and 2008 surveys, including first state records. Predicted distribution models constructed from these observation records will serve to focus attention to other sub-watersheds where they are likely to be documented. Permanently flowing headwater (1st or 2nd order) non-fish bearing streams (Category 2, USFS 2006) within the Northern Rocky Mountain Refugium area of Idaho/Montana contain a higher proportion of aquatic species of conservation concern and endemic/disjunct species than any other forest district in the Northern Region. Documentation of additional SOC and SOI species in this area is likely to continue to occur. Stream geomorphic type and habitat associations of many of these SOC taxa strongly supports the need to strictly enforce Riparian Conservation Areas (RCA) for all Category 2 streams on the Lolo and Clearwater National Forests straddling the Idaho/Montana border. Proper management of these stream types will not only benefit these species, but also the species inhabiting downstream fish-bearing reaches which usually include the SOC Westslope Cutthroat Trout. Loss of source headwater habitats may cause extirpation of these isolated macroinvertebrate meta-populations because recolonization and dispersal is less likely for invertebrates in such a topographically rugged landscape. Numerous stonefly and caddisfly taxa on the SOC list are notoriously weak flyers and may not be able to disperse sufficiently to recolonize sub-basins where populations of these taxa have been extirpated. An additional year of randomized site surveys is needed to ground-truth the predicted distribution models, and refine habitat associations. Adult collections at known larval SOC sites are also needed in order to provide additional taxonomic information concerning unidentifiable larvae and how adults utilize stream and riparian corridors in these headwater systems.

The ultimate goal of this study is to provide biologists and land managers some of the tools they need to make informed management decisions in areas likely to contain these invertebrate species of conservation concern. Conservation recommendations follow below:

- Protect critical watershed habitats (e.g. headwater NRMR areas) for these SOC from future road development and habitat degradation by following RCA management practices and protecting riparian areas (see map of Crucial Areas jointly put together with MT FWP, Figure 24).

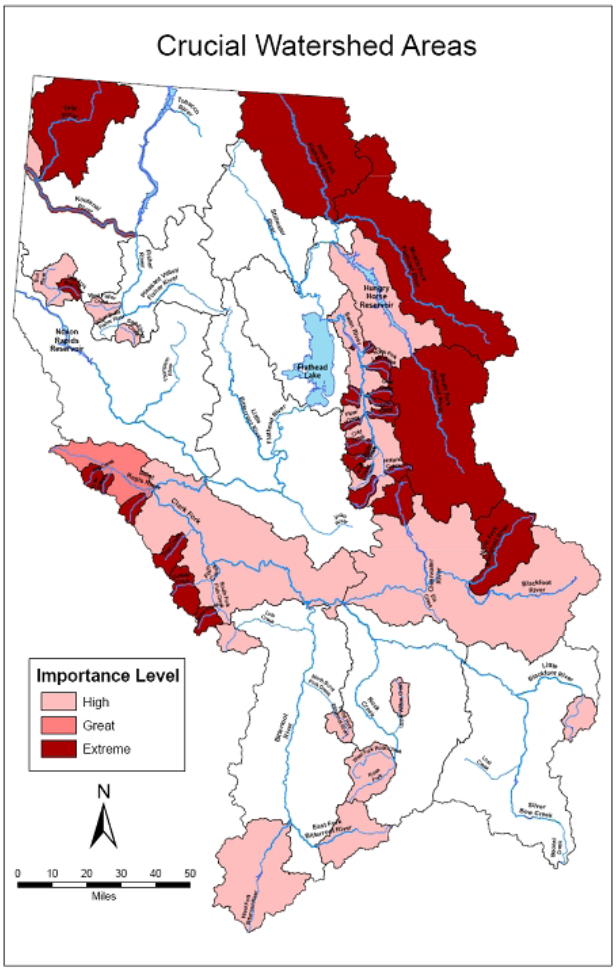

Figure 24. Crucial watersheds of aquatic biodiversity in the upper Columbia Basin in MT.

- The upper St. Regis basin (HUC 170102040804) of the Lolo National Forest, in particular the upper tributaries of Big Creek and Deer Creek downstream to, and including, Chromie Creek, should be designated on the candidate Research

Natural Area list for Montana. This area encompasses one of the foremost examples of a Northern Rocky Mountain Refugium environment in Montana's Lolo National Forest. The Clearwater National Forest in Idaho contains the Aquarius Research Natural Area which was established to preserve a prime example of such an environment, characterized by western red cedar forests with fern-dominated understories, large stands of Pacific-disjunct red alder, and a large representation of other coastal disjunct taxa. A NRMR Lolo RNA would protect these taxa and could be utilized as an ecological reference and control area in critical research on these significant globally rare aquatic invertebrates, including questions pertaining to manipulated (timber harvest) and nonmanipulated forests or various other headwater stream hypotheses.

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Appendix A. Global/State Rank Definitions

Heritage Program Ranks

The international network of Natural Heritage Programs employs a standardized ranking system to denote global (range-wide) and state status. Species are assigned numeric ranks ranging from 1 to 5, reflecting the relative degree to which they are "at-risk". Rank definitions are given below. A number of factors are considered in assigning ranks — the number, size and distribution of known "occurrences" or populations, population trends (if known), habitat sensitivity, and threat. Factors in a species' life history that make it especially vulnerable are also considered (e.g., dependence on a specific pollinator).

Global Rank Definitions (NatureServe 2003)

G1	Critically imperiled because of extreme rarity and/or other factors making it highly vulnerable to extinction
G2	Imperiled because of rarity and/or other factors making it vulnerable to extinction
G3	Vulnerable because of rarity or restricted range and/or other factors, even though it may be abundant at some of its locations
G4	Apparently secure, though it may be quite rare in parts of its range, especially at the periphery
G5	Demonstrably secure, though it may be quite rare in parts of its range, especially at the periphery
T1-5	**Infraspecific Taxon** (trinomial) —The status of infraspecific taxa (subspecies or varieties) are indicated by a "T-rank" following the species' global rank

State Rank Definitions

S1	At high risk because of extremely limited and potentially declining numbers, extent and/or habitat, making it highly vulnerable to extirpation in the state
S2	At risk because of very limited and potentially declining numbers, extent and/or habitat, making it vulnerable to extirpation in the state
S3	Potentially at risk because of limited and potentially declining numbers, extent and/or habitat, even though it may be abundant in some areas
S4	Uncommon but not rare (although it may be rare in parts of its range), and usually widespread. Apparently not vulnerable in most of its range, but possibly cause for long-term concern
S5	Common, widespread, and abundant (although it may be rare in parts of its range). Not vulnerable in most of its range

Combination Ranks

G#G# or S#S#	**Range Rank**—A numeric range rank (e.g., G2G3) used to indicate uncertainty about the exact status of a taxon

Qualifiers

NR	Not ranked
Q	**Questionable taxonomy that may reduce conservation priority**—Distinctiveness of this entity as a taxon at the current level is questionable; resolution of this uncertainty may result in change from a species to a subspecies or hybrid, or inclusion of this taxon in another taxon, with the resulting taxon having a lower-priority (numerically higher) conservation status rank

X	**Presumed Extinct**—Species believed to be extinct throughout its range. Not located despite intensive searches of historical sites and other appropriate habitat, and virtually no likelihood that it will be rediscovered
H	**Possibly Extinct**—Species known from only historical occurrences, but may never-the-less still be extant; further searching needed
U	**Unrankable**—Species currently unrankable due to lack of information or due to substantially conflicting information about status or trends
HYB	**Hybrid**—Entity not ranked because it represents an interspecific hybrid and not a species
?	**Inexact Numeric Rank**—Denotes inexact numeric rank
C	**Captive or Cultivated Only**—Species at present is extant only in captivity or cultivation, or as a reintroduced population not yet established
A	**Accidental**—Species is accidental or casual in Montana, in other words, infrequent and outside usual range. Includes species (usually birds or butterflies) recorded once or only a few times at a location. A few of these species may have bred on the one or two occasions they were recorded
Z	**Zero Occurrences**—Species is present but lacking practical conservation concern in Montana because there are no definable occurrences, although the taxon is native and appears regularly in Montana
P	**Potential**—Potential that species occurs in Montana but no extant or historic occurrences are accepted
R	**Reported**—Species reported in Montana but without a basis for either accepting or rejecting the report, or the report not yet reviewed locally. Some of these are very recent discoveries for which the program has not yet received first-hand information; others are old, obscure reports
SYN	**Synonym**—Species reported as occurring in Montana, but the Montana Natural Heritage Program does not recognize the taxon; therefore the species is not assigned a rank
*	A rank has been assigned and is under review. Contact the Montana Natural Heritage Program for assigned rank
B	**Breeding**—Rank refers to the breeding population of the species in Montana
N	**Nonbreeding**—Rank refers to the non-breeding population of the species in Montana

Appendix B. Aquatic Macroinvertebrate Survey Sites in 2008

Macroinvertebrate sample locations taken by MTNHP & IDCDC for the USFS Aquatic Invertebrate SOC project and the number of Species of Concern detected during 2008 field season.

Stream	Start Latitude	Start Longitude	# SOC
Wendover Creek	46.52123	-114.78894	4
Wendover Creek	46.56059	-114.75006	4
Chromie Creek	47.32054	-115.38445	3
Graves creek trib	46.46124	-115.07521	3
East Fork Papoose Creek trib	46.56059	-114.75006	3
Green Mountain Creek	47.33871	-115.48287	2
Deer Creek trib	47.30490	-115.40703	2
Clearwater stream	46.71323	-115.18383	2
Hidden Creek trib	46.98631	-114.98044	2
South Fork Trout Creek below Heart Lake	46.95600	-114.96576	2
Rock Creek trib	46.96545	-114.78714	2
Swamp Creek trib	46.39163	-114.61828	2
Lee Creek	46.70074	-114.53292	2
Fern Creek	46.86163	-115.62328	1
North Fork Clear Creek	47.61463	-115.59437	1
East Fork Crow Creek	47.50671	-115.54714	1
Wishard Creek	47.31152	-115.48931	1
Elk Summit tribs	46.08435	-115.45017	1
Elk Summit tribs	46.08157	-115.44343	1
Deer Creek trib	47.30749	-115.41088	1
Deer Creek trib	47.30950	-115.40639	1
Pondosa Creek	46.34864	-115.35719	1
South Fork Trout Creek trib	46.97416	-114.98216	1
South Fork Trout Creek trib	46.96753	-114.97844	1
South Fork Trout Creek trib	46.96410	-114.97592	1
South Fork Trout Creek trib	46.96346	-114.97549	1
South Fork Trout Creek trib	46.95445	-114.96520	1
Windfall Creek trib	47.04017	-114.93773	1
Chicken Creek	46.96769	-114.71205	1
Selway Creek tribs	46.65747	-114.62605	1
Elk Summit tribs	46.42343	-114.62355	1
Swamp Creek	46.39720	-114.61972	1
Colt Creek	46.43847	-114.61858	1
Little Blue Creek	47.19242	-114.58881	1
Big Blue Creek	47.21028	-114.57937	1
East Fork Lolo Creek	46.67110	-114.41600	1
Chippy Creek	47.42902	-115.63945	0
Morris Creek	46.85510	-116.20628	0
Clearwater unnamed seep	46.74758	-116.18382	0
Morris Creek trib	46.84140	-116.18368	0
Clearwater stream	46.73783	-116.17432	0
Granite Creek	47.78743	-115.72206	0
Evans Creek main	47.54129	-115.66522	0
Evans Creek tributary	47.54580	-115.65908	0
Cooper Creek tributary	47.51651	-115.65204	0

Stream	Start Latitude	Start Longitude	# SOC
Chippy Creek	47.42902	-115.63945	0
Spokane Creek	47.51421	-115.63209	0
Shamrock Creek	47.42025	-115.62968	0
Goat Creek	46.88397	-115.60437	0
Isabella Creek	46.89175	-115.59760	0
Cox Gulch	47.55948	-115.59388	0
Wash Creek	46.88832	-115.59287	0
Black Creek	46.97533	-115.59137	0
Crystal Creek	47.30518	-115.41127	0
Graves Creek Falls	47.71993	-115.37866	0
Trib to Fish creek	46.34620	-115.35554	0
Race Creek	46.04467	-115.28433	0
Independence Creek	46.83247	-115.17915	0
Clearwater stream	46.72938	-115.07582	0
Hoodoo Creek	46.97939	-115.02737	0
Slide Creek	46.84895	-115.02717	0
Lake Creek	46.94212	-115.01905	0
Clearwater stream	46.85273	-115.01190	0
Kelly Creek trib	46.96660	-115.01150	0
Hidden Creek	46.98151	-114.97789	0
South Fork Trout Creek below Heart Lake	46.95398	-114.96809	0
Trout Creek	47.04462	-114.95147	0
Windfall Creek	47.03820	-114.92846	0
Fishing Creek trib	46.51010	-114.89072	0
Doe Creek trib	46.51012	-114.89071	0
Fishing Creek trib 2nd order	46.54108	-114.86355	0
Siegal Creek	47.29630	-114.78180	0
Siegal Creek	47.27144	-114.72671	0
Siegal Creek	47.26094	-114.71093	0
Blacktail Creek	46.91645	-114.78058	0
Rock Creek	46.97664	-114.75455	0
Trail Creek	46.93615	-114.71776	0
Fish Creek	47.00176	-114.68606	0
Crooked Fork Creek	46.67190	-114.68088	0
St. Louis Creek	47.25325	-114.67158	0
Selway Creek tribs	46.66418	-114.66475	0
West Fork Beecher Creek	47.24712	-114.65819	0
Hoodoo Creek	46.34428	-114.64350	0
East Fork Beecher Creek	47.24362	-114.64298	0
Selway Creek tribs	46.65422	-114.64192	0
Bridge Creek trib	46.36473	-114.63635	0
West Fork Burnt Creek	47.23603	-114.63201	0
Savage Creek trib	46.45078	-114.62122	0
East Fork Burnt Creek	47.22985	-114.61612	0
Rabbit Creek	46.41215	-114.61500	0
Soldier Creek	47.22214	-114.59896	0
Camp Creek	47.21656	-114.59029	0
Howard Creek	47.78934	-114.45769	0

Stream	Start Latitude	Start Longitude	# SOC
Indian Springs trib to Smith River	46.85498	-111.24744	0
Piney Creek	45.10314	-108.59576	0
Sage Creek2	45.21561	-108.56322	0
Sage Creek	45.21412	-108.55654	0
Crooked Creek trib	45.16551	-108.44119	0
Crooked Creek source	45.18181	-108.43607	0
Wyoming Creek	45.13407	-108.43419	0
Crooked Creek source	45.18177	-108.43197	0
Rock Spring trib	45.16863	-108.42248	0
Commissary Creek	45.16980	-108.42247	0
Crooked Creek	45.06102	-108.38927	0
Crooked Creek	45.06165	-108.38902	0
Lost Water Creek	45.14936	-108.36367	0
Charcoal Creek Spring	45.31806	-106.40204	0
Davis Prong Hanging Woman	45.29567	-106.34553	0
Parrish Spring	45.30184	-106.34344	0
Poker Jim Pond Beaver Pools	45.30064	-106.34304	0
Stocker Branch	45.33552	-106.32689	0
Blacks Sawmill Pond	45.34754	-106.28674	0
Blacks Sawmill Pond	45.34888	-106.28523	0
Odell Creek Spring	45.33096	-106.26788	0
Tooley Creek Seep	45.21143	-106.23762	0
Cow Creek	45.30713	-106.23446	0
Little Bear Creek spring	45.18639	-106.23003	0
Little Bear Creek Pools	45.18559	-106.23002	0
Chromo Spring	45.42975	-106.21608	0
North Taylor Creek Spring off road	45.27048	-106.08039	0
Darling Draw Spring, 1.4 miles NW of East Fork Otter Creek	45.64279	-106.03172	0
Reservoir, 1.4 miles NNE of Necessity Reservoir	45.62943	-106.00269	0
East Fork Spring, 1.0 miles NW of Thomas	45.63324	-105.99172	0
Spring, 0.6 miles NNW of Thomas Spring	45.63428	-105.97766	0
Mud Turtle Spring Pool	45.28209	-105.96989	0
Mud Turtle Spring	45.28192	-105.96951	0
Mud Turtle Reservoir	45.28128	-105.96935	0
Wilbur Creek Spring	45.59088	-105.96503	0
Frary Creek Spring	45.59088	-105.96503	0
Phillips Butte Reservoir	45.26324	-105.96457	0
Frary Pond	45.59044	-105.96396	0
Taylor Reservoir	45.22600	-105.95800	0
Slough Grass Reservoir	45.26241	-105.95468	0
Wilbur Creek Reservoir	45.59854	-105.94597	0
Anderson Reservoir	45.28567	-105.92662	0
Plumb Creek Pool	45.19161	-105.86600	0

APPENDIX C. WESTERN PEARLSHELL MUSSEL SURVEY SITES 2006-2008

Western Pearlshell Mussel sample locations surveyed by MTNHP or USFS personnel or compiled during the MTNHP SWG & USFS Inventories 2006-2008 (Population viability: A = Excellent, B = Good, C = fair, D = Poor, E = Absent).

Stream	State	Start_Lat	Start_Long	Marg Viability
Arrastra Creek	MT	46.94601	-112.90140	E
Arrastra Creek	MT	46.94628	-112.90392	E
Barnes Creek	MT	46.61089	-113.16017	E
Basin Creek	MT	46.27460	-112.26588	E
Basin Creek East Fork	MT	46.91220	-115.47480	E
Bear Creek	MT	45.87715	-113.06974	E
Beaver Creek	MT	44.54544	-112.42915	E
Beaver Creek	MT	47.38793	-113.66017	E
Beaver Creek	MT	48.81001	-115.67000	E
Beaver Creek	MT	47.59559	-112.75332	E
Beaver Creek	MT	47.55574	-112.74722	E
Beaverhead River	MT	45.09817	-112.77702	E
Beaverhead River	MT	45.10067	-112.77760	D
Beaverhead River	MT	45.13087	-112.73960	D
Beaverhead River	MT	45.13092	-112.73552	E
Beaverhead River	MT	45.23484	-112.62620	E
Beehive Basin	MT	45.28692	-111.38665	E
Big Boulder Creek	MT	45.57600	-116.06900	E
Big Hole River	MT	45.31248	-113.44893	E
Big Hole River	MT	45.62239	-112.69037	E
Big Hole River	MT	45.70119	-112.73618	E
Big Hole River	MT	45.85939	-113.08424	D
Big Hole River	MT	45.48913	-112.69311	E
Big Hole River	MT	45.43611	-113.45875	E
Big Hole River	MT	45.88315	-113.11738	E
Big Lake Creek	MT	45.56618	-113.49272	E
Big Lake Creek	MT	45.44481	-113.59939	E
Big Pipestone Creek	MT	45.87582	-112.17989	E
Bigfoot Creek	MT	46.10724	-112.13321	E
Birch Creek	MT	45.38117	-112.76881	E
Bison Creek	MT	46.25498	-112.34190	E
Bison Creek	MT	46.25324	-112.34090	E
Bitteroot River	MT	46.72191	-114.04672	E
Bitteroot River	MT	46.75465	-114.06207	E
Bitterroot River	MT	46.52085	-114.10860	E
Bitterroot River	MT	46.58520	-114.06706	E
Blackfoot River	MT	46.91716	-113.01432	E
Blackfoot River	MT	46.91872	-113.01542	E
Blackfoot River	MT	46.93327	-113.11469	C
Blackfoot River	MT	46.94203	-112.94815	D
Blackfoot River	MT	46.94937	-112.63248	E
Blackfoot River	MT	46.95305	-112.60509	E
Blackfoot River	MT	46.98611	-112.39014	E
Blackfoot River	MT	47.01341	-112.45411	E
Blacktail Deer Creek	MT	45.00528	-112.44510	E
Bloody Dick Creek	MT	44.99351	-113.31924	D
Bloody Dick Creek	MT	44.99349	-113.31840	B
Bloody Dick Creek	MT	45.01411	-113.22919	E
Bloody Dick Creek	MT	45.01658	-113.39276	C
Bloody Dick Creek	MT	45.49156	-113.25170	C
Boulder River	MT	45.87309	-111.94333	D
Boulder River	MT	45.97279	-111.88954	E
Boulder River	MT	46.11356	-111.91930	E
Boulder River	MT	46.17734	-112.03230	E
Boulder River	MT	46.26231	-112.34271	E
Bowles Creek	MT	46.19289	-113.75200	E
Bozeman Creek	MT	45.69977	-111.02751	E
Browns Creek	MT	45.06530	-113.21530	E
Browns Creek	MT	45.06537	-113.20299	E
Browns Gulch Creek	MT	46.13467	-112.57754	E
Bull River	MT	48.10509	-115.77752	E
Bull River	MT	48.13600	-115.86681	D
Burnt Fork Bitterroot Cr	MT	46.38484	-113.86330	E
Butler Creek	MT	47.12561	-114.43692	E

Stream	State	Start_Lat	Start_Long	Marg Viability
Cabin Creek	MT	44.87640	-111.34560	E
Calf Creek	MT	46.84788	-110.95653	E
Camas Creek	MT	46.67809	-111.19502	E
Camp Creek	MT	45.65638	-112.61443	E
Canyon Creek	MT	44.19326	-115.24728	E
Canyon Creek	MT	46.80616	-112.24816	E
Chicken Creek	MT	46.80307	-112.76947	D
Chief Joseph Trail Creek	MT	45.64998	-113.70241	E
Chief Joseph Trail Creek	MT	45.65869	-113.81157	C
Chilly Creek	MT	47.78800	-115.29654	E
Clam Creek	MT	45.79933	-113.51334	C
Clark Fork River	MT	47.01450	-114.73930	E
Clay Creek	MT	48.76500	-115.66830	E
Clearwater River	MT	46.96448	-113.37910	D
Clearwater River	MT	47.00088	-113.38251	E
Clearwater River	MT	47.01927	-113.38567	E
Clearwater River	MT	47.11539	-113.44242	C
Clearwater River	MT	47.11602	-113.44477	C
Clearwater River	MT	47.11993	-113.44790	E
Clearwater River	MT	47.12185	-113.44941	E
Clearwater River	MT	47.16471	-113.49012	E
Clearwater River	MT	47.22230	-113.53635	B
Clearwater River	MT	47.22252	-113.53455	C
Clearwater River	MT	47.22252	-113.53455	C
Clearwater River	MT	47.22252	-113.53455	B
Clearwater River	MT	47.22269	-113.53553	B
Clearwater River	MT	47.22321	-113.53679	A
Clearwater River	MT	47.22398	-113.53621	A
Clearwater River	MT	47.22556	-113.53704	A
Clearwater River	MT	47.22758	-113.53673	B
Clearwater River	MT	47.23579	-113.53827	A
Clearwater River	MT	47.23618	-113.53933	E
Clearwater River	MT	47.25202	-113.58281	E
Clearwater River	MT	47.29856	-113.57801	E
Clearwater River	MT	47.29912	-113.57784	E
Clearwater River	MT	47.33348	-113.59690	D
Clearwater River	MT	47.33496	-113.59793	E
Clearwater River	MT	47.34721	-113.58726	E
Clearwater River	MT	47.35230	-113.58255	E
Clearwater River	MT	47.35994	-113.56518	E
Cold Creek	MT	47.79999	-115.29596	E
Colt Creek	MT	47.32610	-113.59731	D
Condon Creek	MT	47.58575	-113.73970	E
Confederate Creek	MT	46.57600	-111.45300	E
Cooney Creek	MT	47.52626	-113.71267	E
Copper Creek	MT	46.04586	-113.58806	E
Copper Creek	MT	46.05487	-113.56688	E
Cottonwood Creek	MT	44.93326	-112.45056	E
Cottonwood Creek	MT	46.86075	-112.98865	E
Cottonwood Creek	MT	47.03075	-113.27275	E
Cottonwood Creek	MT	47.03075	-113.27275	E
Cottonwood Creek	MT	47.03691	-113.26123	E
Cottonwood Creek	MT	47.05053	-113.27153	E
Cougar Creek	MT	44.77958	-111.11499	E
Coyle Creek	MT	47.25786	-115.27180	E
Crow Creek	MT	46.25517	-111.67165	E
David Creek	MT	45.53364	-113.03275	E
Dearborn River	MT	47.19912	-112.09674	E
Dearborn River	MT	47.21904	-112.24185	E
Deep Creek	MT	45.91183	-113.11316	B
Deep Creek	MT	46.32410	-111.29489	E
Deep Creek	MT	46.32685	-111.36639	D
Deep Creek	MT	46.32755	-111.27741	E
Deep Creek	MT	46.33030	-111.27400	D

Stream	State	Start_Lat	Start_Long	Viability
Deep Creek	MT	46.79803	-113.29928	E
Deep Creek	MT	46.79813	-113.29884	E
Deer Creek	MT	47.21022	-113.54196	E
Dempsy Creek	MT	46.31002	-112.93904	E
Devils Creek	MT	47.23733	-114.73783	E
Divide Creek	MT	45.75174	-112.74522	E
Dog Creek	MT	46.64205	-112.37243	E
Dog Creek	MT	46.64205	-112.37243	E
Doolittle Creek	MT	45.71780	-113.34530	E
Douglas Creek	MT	46.86053	-113.00547	E
Dry Creek	MT	46.25026	-111.39569	D
Dry Creek	MT	46.26099	-111.34025	E
Dry Creek	MT	48.29565	-115.84173	E
Duck Creek	MT	44.77998	-111.11357	E
Duck Creek	MT	46.48350	-111.35750	E
Duck Creek	MT	46.48680	-111.38650	E
Eagle Creek	MT	46.82843	-111.16463	E
East Fisher River	MT	47.95641	-115.32267	B
East Fisher River	MT	47.95754	-115.33347	B
East Fork Big Creek	MT	47.29391	-115.45517	E
East Fork Big Creek	MT	47.30385	-115.46003	E
East Fork Bitterroot River	MT	45.85615	-114.02096	C
East Fork Bitterroot River	MT	45.85615	-114.02096	C
East Fork Bitterroot River	MT	45.86590	-113.87117	E
East Fork O'Hara Creek	MT	45.97427	-115.51142	E
East Fork Rock Creek	MT	46.19326	-113.48547	E
East Fork Yaak River	MT	48.93390	-115.45340	E
East Gallatin River	MT	45.72545	-111.06335	D
East Gallatin River	MT	45.82543	-111.14065	E
East Gallatin River	MT	45.83885	-111.16070	D
East Gallatin River	MT	45.86278	-111.20226	D
East Gallatin River	MT	45.87245	-111.23324	D
East Gallatin River	MT	45.88247	-111.24766	D
Eightmile Creek	MT	44.44246	-114.63427	E
Eightmile Creek	MT	44.44246	-114.63427	E
Eightmile Creek	MT	44.44246	-114.63427	E
Elk Creek	MT	44.64440	-111.66360	E
Elk Creek	MT	45.62670	-111.41430	E
Elk Creek	MT	47.48527	-112.38748	E
Elk Creek	MT	47.50237	-112.36515	E
Elk Creek	MT	48.04413	-115.28385	C
Elk Creek	MT	47.51894	-112.30468	E
Elkhorn Creek	MT	45.14264	-111.18682	E
Elkhorn Creek	MT	45.14656	-111.17552	E
Elkhorn Creek	MT	46.25127	-111.96381	E
Fish Creek	MT	45.80618	-112.37225	E
Fisher River	MT	48.24472	-115.29077	E
Fisher River	MT	48.36292	-115.32267	E
Fivemile Creek	MT	48.53498	-115.20319	A
Fivemile Creek	MT	48.53658	-115.19758	B
Flat Creek	MT	47.25204	-112.06489	E
Flint Creek	MT	46.33779	-113.32078	E
Flint Creek	MT	46.36743	-113.33273	E
Flint Creek	MT	46.36802	-113.31720	E
Fourmile Creek	MT	46.54322	-110.74831	E
Fourmile Creek	MT	45.34124	-110.23215	E
Fourth of July Creek	MT	45.65883	-113.06054	E
Fred Burr Creek	MT	46.29542	-113.31710	E
Freezeout Creek	MT	47.77319	-115.29857	E
Gallatin River	MT	45.05445	-111.15644	E
Gallatin River	MT	45.07036	-111.19460	E
Gallatin River	MT	45.28158	-111.22520	E
Gallatin River	MT	45.28158	-111.22520	E
Gallatin River	MT	45.29858	-111.20384	E
Gallatin River	MT	45.29858	-111.20384	E
Gallatin River	MT	45.42645	-111.23251	E
Gallatin River	MT	45.67107	-111.20828	E
Gallatin River	MT	45.73680	-111.21862	E
Gallatin River	MT	45.73944	-111.21866	E
Gallatin River	MT	45.48485	-111.27023	E

Stream	State	Start_Lat	Start_Long	Marg Viability
Glacier Creek	MT	47.52780	-113.72174	E
Gold Creek	MT	45.61560	-113.08420	E
Govenour Creek	MT	45.35110	-113.40863	C
Grasshopper Creek	MT	45.15978	-112.98619	D
Grasshopper Creek	MT	45.23135	-113.07997	C
Grasshopper Creek	MT	45.28294	-113.11921	C
Grasshopper Creek	MT	45.47440	-113.12000	D
Graves Creek Trib	MT	47.75041	-115.29597	E
Grayling Creek	MT	44.80197	-111.10935	E
Grayling Creek	MT	44.85284	-111.06271	E
Green Mountain Creek	MT	47.31486	-115.48841	E
Green Mountain Creek	MT	47.33871	-115.48287	E
Griffin Creek	MT	48.28140	-114.76336	E
Griffin Creek	MT	48.28140	-114.76336	E
Griffin Creek	MT	48.28140	-114.76336	E
Griffin Creek	MT	48.28140	-114.76336	E
Grizzly Creek	MT	46.57458	-113.65663	E
Grouse Creek	MT	45.68259	-113.07309	E
Grouse Creek	MT	45.68687	-113.08568	E
Hargrove Creek	MT	47.20865	-112.27897	E
Herd Creek	MT	44.04940	-114.21110	E
Herd Creek	MT	44.04940	-114.21110	E
High Ore Creek	MT	46.28066	-112.20274	E
Hoodoo Creek	MT	46.98697	-115.01195	E
Horse Prairie Creek	MT	44.97514	-112.92111	E
Horse Prairie Creek	MT	44.97594	-113.25288	E
Horse Prairie Creek	MT	45.01320	-113.22821	C
Horse Prairie Creek	MT	45.01403	-113.22636	C
Horse Prairie Creek	MT	45.02031	-113.11093	E
Horse Prairie Creek	MT	45.02526	-113.05644	E
Hound Creek	MT	47.21526	-111.39342	E
Indian Creek	MT	45.43920	-111.19838	E
Indian Creek	MT	46.31148	-111.66750	E
Indian Creek	MT	46.30944	-111.63357	E
Indian Creek	MT	46.31680	-111.63182	E
Jack Creek	MT	45.35338	-111.54909	E
Jacobsen Creek	MT	45.52999	-113.05441	E
Jacobsen Creek	MT	45.53416	-113.03519	E
Jacobsen Creek trib#1	MT	45.53477	-113.07682	E
Jacobsen Creek trib#2	MT	45.53110	-113.06364	E
Jacobsen Creek trib#2	MT	45.53110	-113.06364	E
Jerry Creek	MT	45.79556	-112.90165	E
Keeler Creek	MT	48.33416	-115.93868	E
Keeler Creek	MT	48.35716	-115.85899	E
Kennedy Creek	MT	47.16473	-114.42344	E
Lake Creek	MT	48.42091	-115.86332	E
LaMarche Creek	MT	45.87830	-113.19860	E
LaMarche Creek	MT	45.91080	-113.21720	E
Lap Creek	MT	48.88000	-115.66000	E
LeMarche Creek	MT	45.87659	-113.19838	E
Little Blackfoot River	MT	46.56287	-112.42737	E
Little Blackfoot River	MT	46.56671	-112.67125	E
Little Blackfoot River	MT	46.57863	-112.52690	E
Little Blackfoot River	MT	46.59514	-112.59203	E
Little Blackfoot River	MT	46.59653	-112.58721	E
Little Boulder Creek	MT	46.20042	-112.09353	E
Little Prickly Pear Creek	MT	46.79768	-112.36914	E
Little Prickly Pear Creek	MT	46.37769	-112.03094	E
Little Prickly Pear Creek	MT	46.46870	-111.98316	E
Little Prickly Pear Creek	MT	46.54062	-111.92699	E
Little Prickly Pear Creek	MT	46.78674	-112.40742	E
Little Prickly Pear Creek	MT	46.85419	-112.17575	E
Little Prickly Pear Creek	MT	46.90260	-112.12404	E
Little Prickly Pear Creek	MT	47.00544	-112.07147	E
Little Sleeping Child Creek	MT	46.12135	-114.12262	E
Little Thompson River	MT	47.69170	-114.81110	C
Little Wolf Creek	MT	48.30518	-115.03511	E
Lodgepole Creek	MT	47.31766	-115.44801	E
Lodgepole Creek trib	MT	47.31196	-115.43340	E
Lolo Creek	MT	46.74326	-114.15562	E

Stream	State	Start_Lat	Start_Long	Viability
Lolo Creek	MT	46.76618	-114.34048	E
Lost Creek	MT	46.22097	-113.02952	E
Lump Gulch	MT	46.47729	-112.07694	E
Madison River	MT	44.64702	-110.93216	E
Madison River	MT	44.65740	-111.06970	C
Madison River	MT	44.66245	-110.99200	B
Madison River	MT	44.70321	-111.09658	C
Madison River	MT	44.70487	-111.09752	C
Madison River	MT	44.71508	-111.10687	C
Mail Cabin Creek	MT	43.49730	-110.98510	E
Mail Cabin Creek	MT	43.49730	-110.98510	E
McCalla Creek	MT	45.31140	-115.11730	D
McCalla Creek	MT	45.31140	-115.11730	D
McCalla Creek	MT	46.51403	-114.11837	E
McCormick Creek	MT	47.14803	-114.49767	E
McCormick Creek	MT	47.15250	-114.48667	E
McCormick Creek	MT	47.15277	-114.48593	E
Meadow Creek	MT	45.69916	-111.02348	E
Meadow Creek	MT	48.78364	-115.92332	E
Medicine Lodge Creek	MT	44.75140	-113.03617	E
Medicine Lodge Creek	MT	44.75140	-113.03617	E
Medicine Lodge Creek	MT	44.87056	-113.00747	E
Medicine Lodge Creek	MT	44.87138	-113.00724	E
Medicine Lodge Creek	MT	44.98369	-112.98329	E
Medicine Rock Creek	MT	46.92880	-112.15036	E
Middle Fork of West Fork	MT	45.28612	-111.38899	E
Middle Fork of West Fork	MT	45.29389	-111.41312	E
Mill Creek	MT	45.45816	-112.28003	E
Monture Creek	MT	47.03767	-113.22010	E
Moose Creek	MT	45.70042	-112.73557	D
Moose Creek	MT	45.71377	-112.70505	E
Moose Creek	MT	45.74195	-112.67339	E
Moose Creek	MT	46.85117	-110.86066	E
Moose Creek Spring	MT	45.63366	-113.07452	E
Mormon Creek	MT	46.70895	-114.21036	E
Mormon Creek	MT	46.71799	-114.14264	E
Morrell Creek	MT	47.15962	-113.46703	E
Muskrat Creek	MT	46.22863	-112.09052	E
Muskrat Creek	MT	46.26495	-112.08293	E
Muskrat Creek	MT	46.28132	-112.20259	E
Muskrat Creek	MT	46.28189	-112.07314	E
Mussingbrod Creek	MT	45.73350	-113.57283	E
Nevada Creek	MT	46.75822	-112.70388	E
Nevada Creek	MT	46.75842	-112.70247	E
Nevada Creek	MT	46.76487	-112.63307	E
Nevada Creek	MT	46.80941	-112.83030	E
Nevada Creek	MT	46.83218	-112.89674	C
Newlan Creek	MT	46.59156	-111.04922	E
Ninemile Creek	MT	47.03125	-114.39298	E
Ninemile Creek	MT	47.03125	-114.39298	E
Ninemile Creek	MT	47.03764	-114.39330	E
Ninemile Creek	MT	47.03764	-114.39330	E
Ninemile Creek	MT	47.08151	-114.43902	E
Ninemile Creek	MT	47.11618	114.50076	D
Ninemile Creek	MT	47.16500	-114.55780	E
No Man Creek	MT	45.11550	-111.49810	E
North Fork Big Hole River	MT	45.64353	-113.65279	C
North Fork Flathead River	MT	48.83676	-114.36791	E
North Fork Glover Creek	MT	46.98789	-116.06131	E
North Fork Greenhorn Creek	MT	45.14210	-112.01287	E
North Fork Little Joe Creek	MT	47.22150	-115.26680	E
North Fork Second Creek	MT	47.16404	-114.71135	E
North Fork Smith River	MT	46.57064	-110.85209	E
North Fork Smith River	MT	46.63818	-110.73520	E
North Fork Smith River	MT	46.68022	-110.71337	E
North Fork Willow Creek	MT	46.56842	-113.35969	B
North Fork Willow Creek	MT	46.58419	-113.41453	E
Obrien Creek	MT	46.85126	-114.17085	E

Stream	State	Start_Lat	Start_Long	Marg Viability
Owl Creek	MT	47.11003	-113.49761	E
Owl Creek	MT	47.11505	-113.47259	D
Owl Creek	MT	47.11599	-113.45740	D
Pete Creek	MT	48.85000	-115.77000	E
Pete Creek	MT	48.90000	-115.81000	D
Pettengill Creek	MT	45.68218	-113.06323	E
Pintlar Creek	MT	45.90720	-113.48110	E
Pintlar Creek	MT	45.90731	-113.48004	E
Pintlar Creek	MT	45.90731	-113.48004	E
Pipe Creek	MT	48.42730	-115.59665	E
Pipe Creek	MT	48.52237	-115.52825	E
Pipe Creek	MT	48.57809	-115.59150	E
Placid Creek	MT	47.14449	-113.59538	E
Prairie Creek	MT	45.73958	-113.87300	E
Quartz Creek	MT	46.80460	-115.44420	D
Racetrack Creek	MT	46.27618	-112.91261	E
Ranch Creek	MT	46.52565	-113.62341	E
Red Rock Creek	MT	46.27610	-112.33050	E
Red Rock River	MT	44.64280	-112.03622	E
Red Rock River	MT	44.64280	-112.03622	E
Red Rock River	MT	44.65547	-112.41129	E
Red Rock River	MT	44.66435	-112.49967	E
Red Rock River	MT	44.69343	-112.65373	E
Red Rock River	MT	44.73092	-112.69155	E
Red Rock River	MT	44.91555	-112.82485	E
Red Rock River	MT	44.63854	-112.13790	E
Red Rock River	MT	44.64219	-111.99532	E
Red Rock River	MT	44.65519	-111.92918	E
Rock Creek	MT	46.39796	-113.68957	E
Rock Creek	MT	46.40818	-112.96772	E
Rock Creek	MT	46.69115	-113.66260	E
Rock Creek	MT	46.70390	-113.67357	E
Ruby Creek	MT	45.54358	-113.75841	E
Ruby River	MT	45.37467	-112.13815	E
Sage Creek	MT	44.73456	-112.65339	E
Sand Basin Creek	MT	46.19362	-113.69407	D
Sand Basin Creek	MT	46.19628	-113.69806	C
Schafer Creek	MT	48.06390	-113.24530	E
Seeley Creek	MT	47.21052	-113.45428	E
Selway Creek	MT	45.10271	-113.42681	D
Seventeenmile Creek	MT	48.63000	-115.72000	E
Seventeenmile North Fork	MT	48.66000	-115.76000	E
Sheep Creek	MT	46.80435	-111.18284	E
Sheep Creek	MT	46.80755	-111.15774	E
Slate Creek	MT	45.69782	-114.28660	E
Slimmer Creek	MT	48.03182	-115.06092	D
Smith Creek	MT	47.55184	-113.69573	E
Smith River	MT	46.58843	-111.05229	E
Smith River	MT	46.58994	-111.05261	E
Smith River	MT	46.67381	-111.14048	D
Smith River	MT	46.67544	-111.14286	E
Smith River	MT	46.72399	-111.18249	E
Smith River	MT	46.75321	-111.16840	E
Smith River	MT	46.75475	-111.17265	E
Smith River	MT	46.75528	-111.17185	E
Smith River	MT	46.79585	-111.17866	E
Smith River	MT	46.80401	-111.18222	E
Smith River	MT	46.80506	-111.18508	E
Smith River	MT	46.87099	-111.27081	D
Smith River	MT	47.26159	-111.42065	E
Smith River	MT	47.32500	-111.43287	E
Smith River	MT	47.38973	-111.44749	E
Smith River	MT	47.39335	-111.44975	E
Smith River	MT	47.39335	-111.44975	E
Smith River	MT	47.39366	-111.44955	E
Smith River tributary	MT	46.58898	-111.05308	E
Snowshoe Creek	MT	48.20493	-115.64683	E
Snowshoe Creek	MT	48.20721	-115.64200	E

Stream	State	Start_Lat	Start_Long	Viability
South Fork Madison River	MT	44.65683	-111.15082	E
South Fork Madison River	MT	44.67870	-111.19432	E
South Fork of West Fork	MT	45.26713	-111.27164	E
South Fork of West Fork	MT	45.26713	-111.27164	E
South Fork Smith River	MT	46.44657	-110.93047	E
South Fork Smith River	MT	46.54840	-111.00908	E
South Fork Smith River	MT	46.40943	-110.89134	E
South Fork Sun River	MT	47.48698	-112.91821	E
South Fork Trout Creek	MT	46.98803	-114.99716	E
Spotted Dog Creek	MT	46.50862	-112.56565	E
Spread Creek	MT	48.87000	-115.95000	E
Spread Creek	MT	48.91000	-115.99000	E
Spring Gulch	MT	45.83646	-112.91764	E
Creek	MT	45.65830	-113.06203	E
State Creek	MT	46.10048	-112.14178	E
Stine Creek	MT	45.71932	-113.02850	E
Stony Creek	MT	46.30917	-113.66917	E
Stony Creek	MT	46.33828	-113.62765	E
Stony Creek	MT	47.10939	-114.39593	E
Stony Creek	MT	47.90656	-113.57200	E
Swamp Creek	MT	46.75090	115.05416	D
Swamp Creek	MT	48.21829	-115.46811	E
Swamp Creek	MT	45.60209	-113.55934	E
Swan River	MT	47.42132	-113.67009	E
Swan River	MT	47.46212	-113.68449	E
Swan River	MT	47.52750	-113.71371	E
Swan River	MT	47.58343	-113.75767	E
Tenmile Creek	MT	46.76196	-113.36937	E
Tenmile Creek	MT	46.76221	-113.37038	E
Thompson Gulch	MT	46.60957	-111.09198	E
Thompson Gulch	MT	46.51630	-111.21327	E
Thompson Gulch	MT	46.51630	-111.21327	E
Thompson Gulch	MT	46.51630	-111.21327	E
Thompson River	MT	47.71273	-115.05859	E
Tin Cup Joe Creek	MT	46.38581	-112.89563	E
Tobacco River	MT	48.89850	-115.12310	D
Trail Creek	MT	44.98246	-113.30718	E
Trail Creek	MT	45.67055	-113.82670	E
Trail Creek	MT	45.65670	-113.80940	C
trib to McCormick Creek	MT	47.17323	-114.42976	E
Trout Creek	MT	46.21670	-113.37675	E
Tunnel Creek	MT	48.35910	-113.67960	E
Turner Creek	MT	48.86504	-115.58359	E
Unnamed trib to Big Creek	MT	47.32606	-115.42636	E
Creek	MT	47.31589	-115.43356	E
Upper Willow Creek	MT	46.36704	-113.49913	A
Upper Willow Creek	MT	46.41119	-113.50617	B
Upper Willow Creek	MT	46.51189	-113.50991	E
Van Ness Creek	MT	47.08209	-114.93553	E
Vermillion River	MT	47.81715	-115.29924	E
Vermillion River	MT	47.84757	-115.30053	E
Vinal Creek	MT	48.86044	-115.64421	C
Warm Springs Creek	MT	45.45440	-113.29940	E
Warm Springs Creek	MT	46.17470	-113.15617	E
West Fork Beaver Creek	MT	44.90346	-111.39455	E
West Fork Beaver Creek	MT	44.90506	-111.36955	E
West Fork Bitterroot River	MT	45.59342	-114.32278	E
West Fork Bitterroot River	MT	45.62165	-114.30388	E
West Fork Bitterroot River	MT	45.62169	-114.30546	E
West Fork Bitterroot River	MT	45.62424	-114.30359	E
West Fork Bitterroot River	MT	45.62509	-114.30269	E
West Fork Bitterroot River	MT	45.66772	-114.30425	E
West Fork Bitterroot River	MT	45.76737	-114.28232	E
West Fork Bitterroot River	MT	45.80501	-114.26225	E
West Fork Bitterroot River	MT	45.81490	-114.25336	E
West Fork Bitterroot River	MT	45.92777	-114.13366	E
West Fork Bitterroot River	MT	45.92963	-114.13320	E
West Fork Bitterroot River	MT	45.93132	-114.13190	E
West Fork Gold Creek	MT	47.02147	-113.77726	E

Stream	State	Start_Lat	Start_Long	Marg Viability
West Fork Jimmie New Cr	MT	45.83977	-112.95124	E
West Fork Jimmie New Cr	MT	45.83977	-112.95124	E
West Fork Lolo Creek	MT	46.63892	-114.58026	E
West Fork Lolo Creek	MT	46.63892	-114.58026	E
West Fork Rock Creek	MT	46.19160	-113.70210	D
West Fork Rock Creek	MT	46.19348	-113.70742	D
West Fork Rock Creek	MT	46.19816	-113.74045	E
West Fork Rock Creek	MT	46.20057	-113.73115	E
West Fork Rock Creek	MT	46.21278	-113.70087	C
West Fork RockCreek	MT	46.20165	-113.70170	A
West Fork Yaak River	MT	48.95856	-115.61154	D
Whitetail Creek	MT	45.96225	-112.16093	E
Willow Creek	MT	45.44810	-112.82785	E
Willow Creek	MT	45.43810	-112.74220	E
Willow Creek	MT	45.44810	-112.82780	E
Wisconsin Creek	MT	45.59667	-113.34027	E
Wisconsin Creek	MT	46.29542	-113.31710	E
Wise River	MT	45.61068	-113.09101	E
Wise River	MT	45.61450	-113.08940	E
Wise River	MT	45.66396	-113.06375	E
Wise River	MT	45.73461	-113.01626	E
Wise River	MT	45.79206	-112.95128	E
Wolf Creek	MT	48.26410	-115.15415	C
Wolf Creek	MT	48.29862	-115.04420	C
Wolf Creek	MT	48.30174	-115.03806	C
Wolf Creek	MT	48.30627	-115.03677	E
Yaak River	MT	48.56106	-115.97762	D
Yaak River	MT	48.64450	-115.88620	D
Yaak River	MT	48.82761	-115.81282	E
Yaak River East Fork	MT	48.94000	-115.54000	E
Yaak River East Fork	MT	48.94300	-115.48000	E
Yaak River South Fork	MT	48.72000	-115.64000	E
Yaak River South Fork	MT	48.79000	-115.66000	E
Yaak River South Fork	MT	48.82000	-115.68000	E
Yaak River Upper East Fork	MT	48.93282	-115.45085	E
	MT	NAD 27		
Cameron Creek	MT	45.50171	-113.58545	C
Cameron Creek	MT	45.53401	-113.57242	B
Little Sleeping Child	MT	46.07594	-114.07321	B
Bitterroot River	MT	46.00901	-114.09854	B
East Fork @ Rocky Knob	MT	45.52255	-114.02809	D
Willow Creek	MT	46.17367	-113.57517	E
Willow Creek	MT	46.17313	-113.56394	E
Lost Horse Creek	MT	46.06030	-114.15307	E
Sawmill Creek	MT	46.26506	-113.54140	E
Sleeping Child Creek	MT	46.07559	-114.03288	E
Sleeping Child Creek	MT	46.07483	-114.02524	E
Sleeping Child Creek	MT	46.08072	-114.04032	E
Two Bear Creek	MT	46.06433	-114.00292	E
Threemile Creek	MT	46.37162	-113.54498	E
Threemile Creek	MT	46.36460	-113.52502	E
Ambrose Creek	MT	46.32306	-113.54037	E
Ambrose Creek	MT	46.32344	-113.55051	E
Burnt Fork	MT	46.24244	-113.54135	E
Burnt Fork	MT	46.2345.9	-113.54072	E
Gold Creek	MT	46.23399	-113.54066	E
Rye Creek	MT	45.58385	-114.01243	E
Skalkaho Creek	MT	46.09315	-113.57514	E
Skalkaho Creek	MT	46.09433	-113.57048	E
Poker Joe Landing	MT	46.35000	-114.04120	E
Upper Little Sleeping Child	MT	46.06138	-114.06039	E
Deer Creek	MT	45.35347	-114.19258	E
Lodgepole Creek	MT	45.50289	-113.48788	E
Meadow Creek	MT	45.51959	-113.48256	E
Meadow Creek	MT	45.51124	-113.49237	E
Meadow Creek	MT	45.49759	-113.48106	E
Swift Creek	MT	45.53298	-113.45964	E
West Fork Bitterroot River	MT	45.48881	-114.15378	E
West Fork Bitterroot River	MT	45.37498	-114.18149	E

Stream	State	Start_Lat	Start_Long	Viability
East Fork Bitterroot River	MT	45.55777	-113.43451	E
West Fork Camp Creek	MT	45.45.229	-113.56563	E
Warm Springs Creek	MT	45.49438	-114.03809	E
Laird Creek	MT	45.51390	-114.04086	E
Gilbert Creek	MT	45.51491	-114.04399	E
Nez Perce Creek	MT	45.46270	-114.20119	E
	MT	UTM Zone 12 East	North	
Canyon Creek	MT	349017	5054250	E
Canyon Creek	MT	355438	5059809	E
Doolittle Creek	MT	317985	5064804	E
Doolittle Creek	MT	317105	5065349	E
Steel	MT	316736	5052191	E
Wise River	MT	337318	5045400	E
Jacobsen Creek	MT	338223	5043645	E
Wyman Creek	MT	332399	5046193	E
Jerry Creek	MT	354217	5076715	E
Bison Creek	MT	396680	5122996	E
Boulder River	MT	386513	5123353	E
Baggs Creek	MT	377354	5138755	E
Beefstraight Creek	MT	358014	5093587	E
Beefstraight Creek	MT	359523	5093596	E
Moose Creek	MT	378106	5069378	E
Fish Creek	MT	391203	5072697	E
Berry Creek	MT	303398	5014073	E
Trapper Creek	MT	353598	5055040	E
Odell Creek	MT	328201	5047417	E
Twelvemile Creek	MT	337391	5093367	E
Halfway Creek	MT	399363	5089849	E
Hells Canyon Creek	MT	391881	5056995	E
Racetrack Creek	MT	35226	5126556	E
Lost Creek	MT	346682	5118169	E
Trail Creek	MT	276953	5064839	B
Miner Creek	MT	300628	5023574	C
Nine Mile Creek	MT	47 08 025	114 30 948	C
Nine Mile Creek	MT	47 06 907	114 30 028	D
Nine Mile Creek	MT	47 06 998	114 30 059	E
Nine Mile Creek	MT	47 12 057	114 36 457	E
Nine Mile Creek	MT	47 01 862	114 23 603	E
Petty Creek	MT	46 55 824	114 26 739	E
Petty Creek	MT	46 56 778	114 25 922	E
Petty Creek	MT	46 57 030	114 25 897	E
Cache Creek	MT	46 48 065	114 39 240	E
Fish Creek	MT	46 57 660	114 39 678	E
Fish Creek	MT	46 59 328	114 39 804	E
South Fork Fish Creek	MT	46 50 780	114 41 016	E
West Fork Fish Creek	MT	46 55 608	114 42 084	E
West Fork Fish Creek	MT	46 55 827	114 44 225	E

Stream	State	Start_Lat	Start_Long	Marg Viability
		NAD 83		
Big Boulder Creek	ID	45.57600	-116.06900	F
Browns Creek	ID	46.36608	-115.79184	F
Browns Creek	ID	46.34484	-115.78012	B
Canyon Creek	ID	44.19326	-115.24728	F
Crawfish Creek	ID	44.15140	-110.67450	C
Doe Creek trib	ID	46.51012	-114.89071	F
East Fork O'Hara Creek	ID	45.97427	-115.51142	F
East Fork Papoose Creek	ID	46.56059	-114.75006	F
Eightmile Creek	ID	44.44246	-114.63427	F
El Dorado Creek	ID	46.28378	-115.71257	A
El Dorado Creek	ID	46.29843	-115.64607	C
confluence	ID	46.25852	-115.69258	A
Fishing Creek trib	ID	46.51010	-114.89072	F
Fishing Creek trib 2nd order	ID	46.54108	-114.86355	F
Henrys Fork	ID	43.82660	-111.90380	B
Herd Creek	ID	44.04940	-114.21110	F
Little Firehole River	ID	44.48290	-110.85270	B
Lolo Creek	ID	46.31645	-115.74680	C
Madison River	ID	44.64850	-110.94740	B
Mail Cabin Creek	ID	43.49730	-110.98510	C
McCalla Creek	ID	45.31140	-115.11730	D
McCalla Creek	ID	45.31140	-115.11730	D
Meadow Creek	ID	46.03960	-115.29420	B
Mid Fk Salmon River	ID	45.30070	-114.57120	B
Musselshell Creek	ID	46.35104	-115.76110	A
Musselshell Creek	ID	46.35143	-115.76091	A
Musselshell Creek	ID	46.34427	-115.77849	A
Musselshell Creek	ID	46.39093	-115.74305	A
North Fork Clearwater River	ID	46.72040	-115.29180	C
North Fork Glover Creek	ID	46.98789	-116.06131	F
Pahsimeroi River	ID	44.69140	-114.04810	B
Polecat Creek	ID	44.10770	-110.68360	C
Quartz Creek	ID	46.80460	-115.44420	D
Red River	ID	45.80190	-115.41180	B
Red River	ID	45.79030	-115.39470	B
Salmon River	ID	44.70330	-114.04260	C
Salmon River	ID	44.54510	-114.17950	C
Silver Creek	ID	43.24580	-113.99530	B
St Joe River	ID	47.15970	-115.41970	C
Swamp Creek	ID	46.75090	115.05416	C
Teton River	ID	43.72320	-111.18930	C
Wendover Creek	ID	46.52123	-114.78894	F